Setting the Standard with the Worlds Most Valued Grinders

ACCU-MASTER/*ACCU*-PRO AUTOMATIC REEL GRINDER WITH *ACCU*-TOUCH

- TRANSLATION OF ORIGINAL INSTRUCTIONS-

This book consists of two manuals:

The OPERATORS MANUAL which contains all the information on operating and routine daily maintenance on this equipment.

The SERVICE MANUAL which is used by the maintenance department to do all maintenance except routine daily maintenance.

Setting the Standard with the Worlds Most Valued Grinders

We are committed to:

Providing superior customer support, training, and service.

Manufacturing the highest quality products at an unequaled value.

Setting the industry standard by investing in technological product innovation.

Manufacturing products specifically designed to maintain original equipment manufacturers' specifications.

Interacting with and supporting all original equipment manufacturers.

ACCU-Master 652
ACCU-Pro 632
AUTO - INDEX
SPIN / RELIEF
REEL MOWER GRINDER
with *ACCU*-Touch

Patent No. 6,010,394
6,290,581 & 6,685,544

OPERATORS MANUAL

- TRANSLATION OF ORIGINAL INSTRUCTIONS-

⚠ WARNING

You must thoroughly read and understand all manuals before operating the equipment, paying particular attention to the Warning & Safety instructions.

IMPORTANT SAFETY MESSAGE

This manual will cover the installation and operation of this Reel Grinder, there is an additional manual that addresses the service of this equipment. As manufacturers of reel grinders, we want to confirm to you, our customers, our concern for safety. We also want to remind you about the simple, basic, and common sense rules of safety when using a reel grinder. Failure to follow these rules can result in severe injury or death to operators or bystanders.

It is essential that everyone involved in the assembly, operation, transport, maintenance, and storage of this equipment be aware, concerned, prudent, and properly trained in safety. Always use proper shielding and personal protective equipment as specified by the manufacturer.

Our current production machines include, as standard equipment, guards or shields for the grinding wheel, safety signs and operators and service manuals. Never bypass or operate the machine with any of the guards or safety devices removed, or without the proper personal safety equipment.

Read and fully understand all the safety practices discussed in this manual. All safety rules must be understood and followed by anyone who works with reel grinders.

Before operating a reel grinder, an operator must read and understand all of the information in the operator's manual and understand all the safety signs attached to the product. A person who has not read or understood the operators manual and safety signs is not qualified to operate the unit. Accidents occur often on machines that are used by someone who has not read the operators manual and is not familiar with the equipment. If you do not have an operators manual or current production safety signs, contact the manufacturer or your dealer immediately.

Reel grinders are designed for one-person operation. Never operate the grinder with anyone near, or in contact with, any part of the grinder. Be sure no one else, including bystanders, are near you when you operate this product.

Following these simple, basic safety rules, as well as others:
Find and understand all safety signs in the operators manual and on the equipment. This will help minimize the possibility of accidents and increase your productivity in using this product. Be careful and make sure that everyone who operates the grinder knows and understands that it is a very powerful piece of machinery, and if used improperly, serious injury or death may result. The final responsibility for safety rests with the operator of this machine.

Throughout this manual, the following safety symbols will be used to indicate the degree of certain hazards.

This symbol is used to indicate important information.

This symbol is used throughout this manual to call attention to the safety procedures.

DANGER **The word DANGER indicates an immediate hazardous situation, which if not avoided, will result in death or serious injury.**

WARNING **The word WARNING indicates a potential hazardous situation, which if not avoided, could result in death or serious injury.**

CAUTION **The word CAUTION preceeded with a safety alert symbol indicates a potential hazardous situation which, if not avoided, may result in minor or moderate injury.**

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632 - SPECIFICATIONS

Electrical Requirements	115VAC 50/60 Hz, 20-amp circuit
Electrical Requirements with transfomer	230VAC 50/60 Hz, 8-amp circuit
Net Weight	1490 lbs [676 kg]
Shipping Weight	1770 lbs [803 kg]
Sound Level	More than 75 Dba, Less than 95 Dba

OPERATING CONDITIONS: **THIS MACHINE IS INTENDED FOR INDOOR USE ONLY.**

AMBIENT TEMPERATURE: +5°C/ 40°F to +40°C/ 100°F

RELATIVE HUMIDITY: 50% RH, +40°C / 100°F. Higher RH may be allowed at lower temperatures.
- no condensation must be present.

ALTITUDE: up to 1000m/ 3280 ft. above mean sea level.

TRANSPORTATION AND STORAGE: -25°C/-15°F to +55°C / 130°F
Means must be provided to prevent damage from humidity, vibration and shock.

WARNING

FACTORY PRESET. FLASHING GREEN LIGHT INDICATES LOW VOLTAGE. FLASHING RED LIGHT INDICATES HIGH VOLTAGE DELIVERED TO GRINDER

Low Voltage Relay

The grinder is equipped with a high-low voltage relay which is factory preset at 100-140 VAC. If the power supply line does not deliver 100-140 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is incorrect and must be correct before proceeding further with the grinder.

DAILY MAINTENANCE BY THE OPERATOR

On a daily basis, clean the machine by wiping it off, and cleaning it using the built-in vacuum.
On a daily basis, remove all grinding grit from the grinding head and bellows area.
On a daily basis, inspect the machine for loose fasteners or components.
Contact your company's Maintenance Department if damaged or defective parts are found.

DO NOT USE COMPRESSED AIR TO CLEAN GRINDING DUST FROM GRINDER.

652 - SPECIFICATIONS

Electrical Requirements	115VAC 50/60 Hz, 20-amp circuit
Electrical Requirements with transfomer	230VAC 50/60 Hz, 8-amp circuit
Net Weight	1829 lbs [829 kg]
Shipping Weight	2170 lbs [984 kg]
Sound Level	Less than 75 Dba

OPERATING CONDITIONS: **THIS MACHINE IS INTENDED FOR INDOOR USE ONLY.**

AMBIENT TEMPERATURE: +5°C/ 40°F to +40°C/ 100°F

RELATIVE HUMIDITY: 50% RH, +40°C / 100°F. Higher RH may be allowed at lower temperatures.
- no condensation must be present.

ALTITUDE: up to 1000m/ 3280 ft. above mean sea level.

TRANSPORTATION AND STORAGE: -25°C/-15°F to +55°C / 130°F
Means must be provided to prevent damage from humidity, vibration and shock.

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Contact your company's Maintenance Department if damaged or defective parts are found.

DO NOT USE COMPRESSED AIR TO CLEAN GRINDING DUST FROM GRINDER.

PREPARATION/INSTALLATION CHECK LIST

Before using this equipment refer to the list below. Verify that all of the listed items are completed before powering up the equipment:

1. Equipment is completely assembled
2. All shields are in place and in good condition.
3. All decals are in place and readable.
4. Overall condition good (i.e. paint, welds, electrical)
5. Verify there is sufficient electrical power to operate the machine.
6. Read and understand all areas of the Operator's manual, and review the Service Manual, and any additional training material if available.
7. Understand traverse proximity switch positioning
8. Understand general maintenance

Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustments and operating procedures before attempting to operate the equipment. Replacement manuals can be obtained from your selling dealer or the manufacturer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate and clean the unit as specified. Please observe all safety information in this manual and safety decals on the equipment.

⚠ CAUTION

This machine is intended for grinding the reel from a reel type mowing unit ONLY. Any use other than this may cause personal injury and void the warranty.

To assure the quality and safety of your machine and to maintain the warranty, you MUST use original equipment manufactures replacementparts and have any repair work done by a qualified professional.

ALL operators of this equipment must be thoroughly trained BEFORE operating the equipment.

Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder. Machine is for indoor use only. Do not powerwash machine.

⚠ WARNING

TO AVOID INJURY, READ AND UNDERSTAND THE SAFETY ITEMS LISTED BELOW. IF YOU DO NOT UNDERSTAND ANY PART OF THIS MANUAL AND NEED ASSISTANCE, CONTACT YOUR LOCAL DEALER OR THE MANUFACTURER.

1. **KEEP GUARDS IN PLACE** and in working order.

2. **REMOVE WRENCHES AND OTHER TOOLS.**

3. **KEEP WORK AREA CLEAN.**

4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use the grinder in damp or wet locations. Machine is for indoor use only. Keep the work area well lit.

5. **KEEP ALL VISITORS AWAY.** All visitors should be kept a safe distance from the work area.

6. **MAKE THE WORK AREA CHILD-PROOF** with padlocks or master switches.

7. **DON'T FORCE THE GRINDER.** It will do the job better and safer if used as specified in this manual.

8. **USE THE RIGHT TOOL.** Don't force the grinder or an attachment to do a job for which it was not designed.

9. **WEAR PROPER APPAREL.** Wear no loose clothing, gloves, neckties, or jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair. Wear a respirator or filter mask where appropriate. Wear protective gloves.

10. **ALWAYS USE SAFETY GLASSES.**

11. **SECURE YOUR WORK.** Make certain that the cutting unit is securely fastened with the clamps provided before operating.

12. **DON'T OVERREACH.** Keep proper footing and balance at all times.

13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in the Operators and Service Manual for lubrication and preventive maintenance.

14. **DISCONNECT POWER BEFORE SERVICING,**or when changing the grinding wheel.

15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure that all switches are OFF and the E-stop is pressed in before plugging in the Grinder.

16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury or damage to the equipment.

17. **CHECK FOR DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.

18. **NEVER LEAVE THE GRINDER RUNNING UNATTENDED. TURN THE POWER OFF.** Do not leave grinder until it comes to a complete stop.

19. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as the specific potential hazards.

20. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in Service Manual for the proper location and part numbers of safety decals.

21. **DO NOT OPERATE GRINDER WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION.**

⚠ WARNING

IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.

Grinding is a safe operation if the few basic rules listed below are followed. These rules are based on material contained in the ANSI B7.1 Safety Code for "Use, Care and Protection of Abrasive Wheels". For your safety, we suggest you benefit from the experience of others and carefully follow these rules.

DO

1. **DO** always **HANDLE AND STORE** wheels in a **CAREFUL** manner.
2. **DO VISUALLY INSPECT** all wheels before mounting for possible damage.
3. **DO CHECK MACHINE SPEED** against the established maximum safe operating speed marked on the wheel.
4. **DO CHECK MOUNTING FLANGES** for equal and correct diameter.
5. **DO USE MOUNTING BLOTTERS** that are supplied with the wheels.
6. **DO** be sure **WORK REST** is properly adjusted.
7. **DO** always **USE A SAFETY GUARD COVERING** at least one-half of the grinding wheel.
8. **DO** allow **NEWLY MOUNTED WHEELS** to run at operating speed, with guard in place, for at least one minute before grinding.
9. **DO** always **WEAR SAFETY GLASSES** or some type of approved eye protection when grinding.
10. **DO TURN OFF COOLANT** before stopping to avoid creating an out-of-balance condition.

DON'T

1. **DON'T** use a cracked wheel or one that **HAS BEEN DROPPED** or has become damaged.
2. **DON'T FORCE** a wheel onto the machine **OR ALTER** the size of the mounting hole - if the wheel won't fit the machine, get one that will.
3. **DON'T** ever **EXCEED THE MAXIMUM OPERATING SPEED** established for the wheel.
4. **DON'T** use mounting flanges on which the bearing surfaces **ARE NOT CLEAN, FLAT AND FREE OF BURRS.**
5. **DON'T TIGHTEN** the mounting nut excessively.
6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code B7.2 for exception).
7. **DON'T** start the machine until the **WHEEL GUARD IS IN PLACE.**
8. **DON'T JAM** the work into the wheel.
9. **DON'T STAND DIRECTLY IN FRONT** of a grinding wheel whenever a grinder is started.
10. **DON'T FORCE THE GRINDING** so that motor slows noticeably or that the work piece gets hot.

⚠ WARNING

AVOID INHALATION OF DUST generated by grinding and cutting operations. Exposure to dust may cause respiratory ailments. Use approved NIOSH or MSHA respirators, safety glasses or face shields, and protective clothing. Provide adequate ventilation to eliminate dust, or to maintain dust level below the Threshold Limit Value for nuisance dust as classified by OSHA.

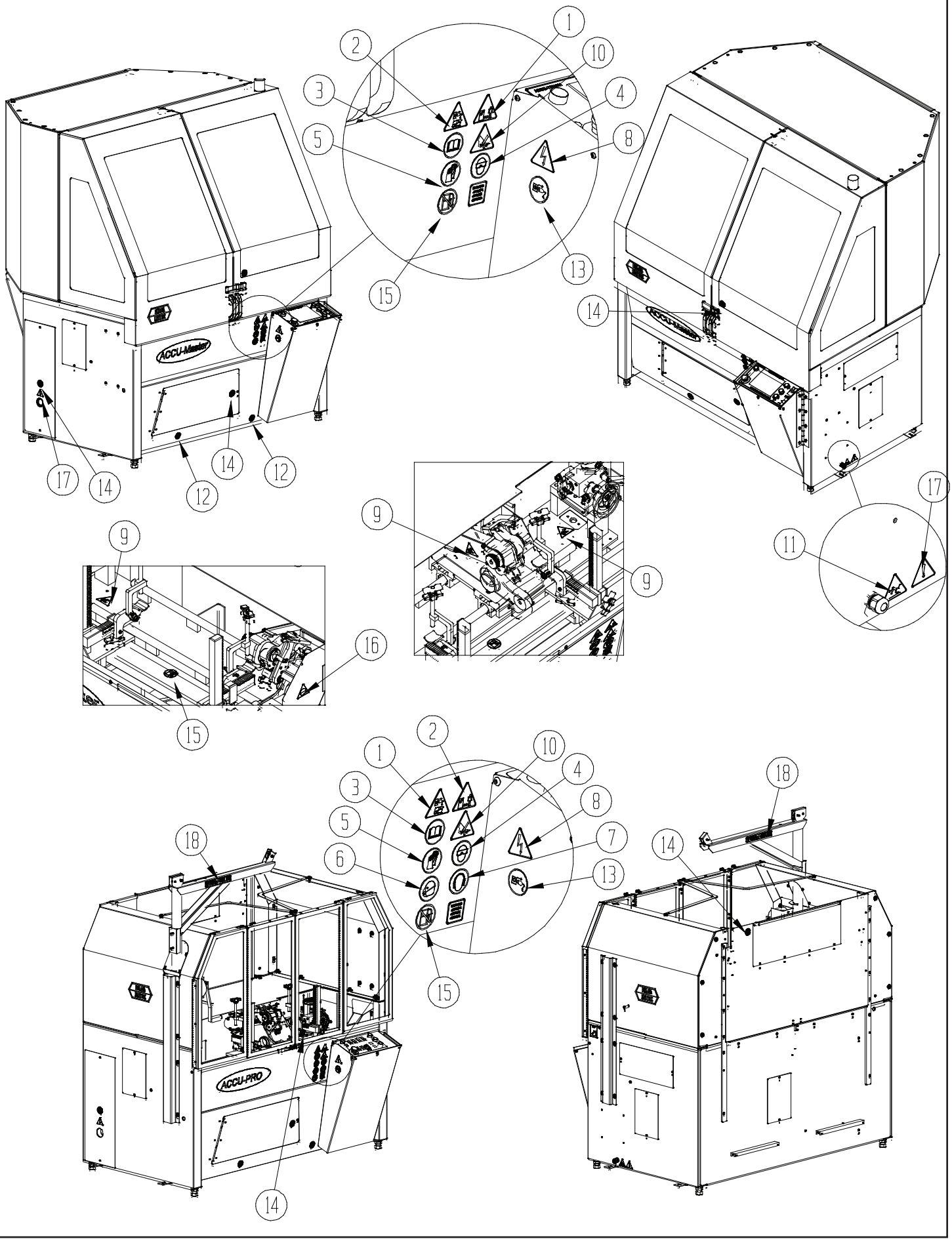
Read carefully before attempting to operate or service your optional electric winch or the Optional Workstation! Failure to comply with instructions could result in personal injury and/or property damage!

⚠ WARNING **FOR YOUR OWN SAFETY AND THAT OF OTHERS, THIS EQUIPMENT MUST BE USED AS RECOMMENDED BY THE MANUFACTURER. FAILURE TO HEED THE FOLLOWING RECOMMENDATIONS COULD ENDANGER YOUR LIFE.**

1. Maximum lifting capacity is 400 pounds (180 kg.) in single line winch operation. **DO NOT ATTEMPT TO MOVE LOADS GREATER THAN THIS RATINGS.**
2. **NEVER CARRY** personnel on the hook/ramp or the load.
3. **NEVER MOVE A LOAD** with this winch/(632) workstation until all personnel are clear.
4. **DO NOT ALLOW** unqualified personnel to operate this unit.
5. **KEEP CLEAR OF RAMP OR WINCH WIRE ROPE AND HOOK WHEN OPERATING. DO NOT ATTEMPT** to guide wire rope by hand as it rewinds.
6. **AVOID** excessive inching and quick reversals of load.
7. **BE SURE** that the power supply is disconnected before performing maintenance and repair procedure.
8. **DO NOT OPERATE** this unit if it is not functioning properly.
9. **KEEP (632) WORKSTATION/WINCHING AREA CLEAR**. Do not allow people to remain in the (632)workstation/winching area. Do not stand between the winch and load.
11. **ALLOW (632)WORKSTATION/WINCH TO COOL DOWN FREQUENTLY**, as the motor is designed for intermittent duty only. When the metal motor housing is hot to touch, it is time to let the winch cool down
12. **DO NOT OPERATE (632)WORKSTATION/ WINCH WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION.**
13. **DO NOT USE (632) WORKSTATION/WINCH TO HOLD LOADS IN PLACE**. Use other means of securing loads, such as tie down straps.
14. **USE ONLY FACTORY APPROVED SWITCHES, REMOTE CONTROLS AND ACCESSORIES**. Use of non-factory approved components may cause injury or property damage and could oid your warranty.
15. **DO NOT MACHINE OR WELD ANY PART OF THE WORKSTATION/WINCH**. Such alterations may weaken the structural integrity of the workstation/winch and could void your warranty.
16. **DO NOT OPERATE THIS (632) WORKSTATION/WINCH OUT DOORS OR IN A CORROSIVE OR EXPLOSIVE ENVIRONMENT**.

NOTE: THE FOLLOWING APPLY TO OPERATION OF THE WINCH ONLY.

1. **MAINTAIN A MINIMUM OF 4 TURNS OF WIRE ROPE** around the winch drum to prevent the wire rope from pulling off under load.
2. **WHEN SPREADER BAR ASSEMBLY IS USED** be sure it is properly seated in the saddle of the hook.
3. **NEVER HOOK THE WIRE ROPE BACK ON ITSELF. USE THE SPREADER BAR ASSEMBLY.** Hooking the wire rope back on itself creates an unacceptable strain on the wire rope.
4. **DO NOT** use the wire rope as a ground for welding.
5. **NEVER TOUCH** a welding electrode to the wire rope.
6. **INSPECT WIRE ROPE FREQUENTLY**. A frayed wire rope with broken strands should be replaced immediately. Never replace the wire rope with rope of any kind or with wire rope other than the type and size specified in the repair parts section of this manual.
7. **USE HEAVY LEATHER GLOVES** when handling the wire rope to eliminate the possibility of cuts or scratches from burrs and slivers from broken strands.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ACCU-Master
ACCU-PRO

READ, UNDERSTAND AND LOCATE ALL DECALS BEFORE OPERATING THIS EQUIPMENT.

1

Keep visitors at a safe distance away from the equipment.

2

Read Service manual and disconnect power before servicing.

3

Refer to manual– after installation, read the user's guide carefully before operating. Follow all operating and other instructions carefully.

4

WARNING! Use of proper eyewear is mandatory when operating this equipment.

5

WARNING! Gloves or other **hand protection is required** when operating this equipment.

6

WARNING! Operators and people in close proximity **must wear respirators or have adequate ventilation systems.**

7

WARNING! **Hearing protection required** when operating this equipment.

8

This is the electrical hazard symbol. It indicates that there are **DANGEROUS HIGH VOLTAGES PRESENT** inside the enclosure of this product. TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, do not attempt to open the enclosure or gain access to areas where you are not instructed to do so. **REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.**

9

Entanglement Hazard. Keep clear of belt.

10

Sharp object in the vicinity which may cause injury. **Keep hands clear of sharp edges!**

11

Power cord may be a trip hazard. Secure the power cord in a manner that removes it as a trip hazard.

12

Use a Fork Lift with a minimum of 48" [122cm] long forks to move this Equipment. Lift only where indicated on the machine. Failure to use proper lifting equipment may result in personal injury or damage to the equipment.

13

Unplug the machine when servicing or storing for an extended period of time.

14

WARNING! Do Not Operate Without Guards and Covers in Place. There are moving parts located behind guard.

15

WARNING! Keep exposed gasoline or flammables away from the grinder because it operates with a large amount of sparks.

16

Shows the minimum speed [3600 RPM] that the grinding wheel must be rated for to use on this equipement.

17

POWER CORD PROTECTION – The power supply cord for this product acts as the main-disconnect. It should be routed or installed in such a manner to protect it from being walked on or pinched. The unit should be powered down completely before connecting or disconnecting the power cable. The power cord should be removed before moving the unit. **The power cord must be placed near an easily accessible unobstructed socket outlet.**

18

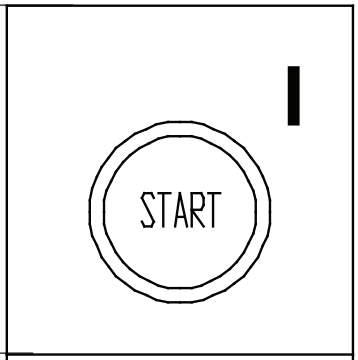
WINCH AND BOOM CAPACITY IS A MAXIMUM OF 180Kg OR 400 LBS. Exceeding the capacity may result in personal injury or damage to the equipment.

CONTROL PANEL COMPONENT IDENTIFICATION

Review the following control panel component descriptions before proceeding with the instructions.

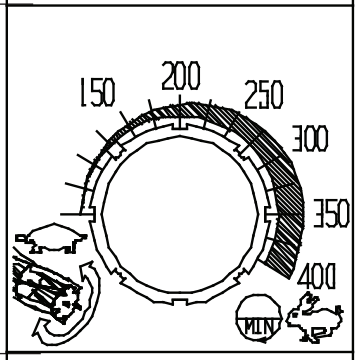
SYSTEM START SWITCH

Powers all control panel systems.
Pulls in the main magnetic starter.



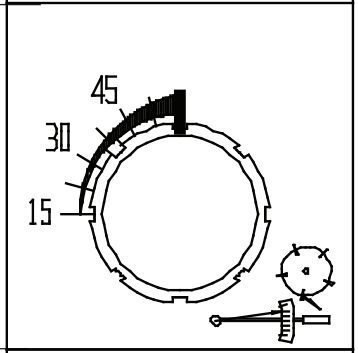
SPIN SPEED DIAL
RPM

Adjusts the speed of reel rotation when you have the grind progam set at variable speed spin.



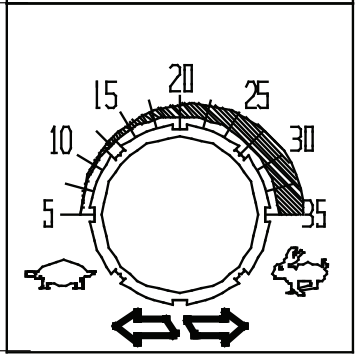
RELIEF TORQUE DIAL

Adjusts the Spin Drive Motor torque. The torque holding the reel blade to the relief finger when you have grind program set at variable Torque Relief.



TRAVERSE SPEED DIAL - FT/MIN

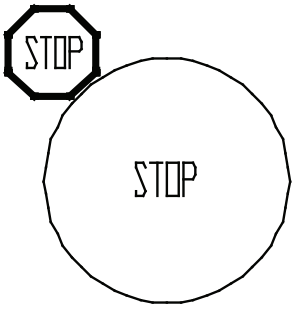
Adjusts the speed of the left & right movement of the Grinding Wheel (Carriage) in both Auto program and Manual Jog.



EMERGENCY STOP BUTTON

Push to cut all power to the control panel functions. Stops all motors, including grinding motor, traverse motor, infeed stepper motor, etc. To restore power, pull up on button and press the Start button.

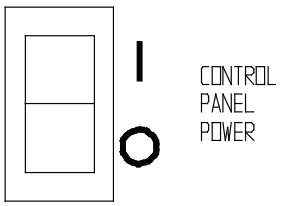
PUSHING THE EMERGENCY STOP BUTTON DOES NOT STOP ALL POWER TO THE GRINDER. POWER IS STILL DELIVERED TO THE PLC, TOUCH SCREEN, AND THE INFEED SIDE OF THE MAGNETIC CONTACTOR. DISCONNECT THE CORD AT THE WALL OUTLET BEFORE PERFORMING SERVICE.



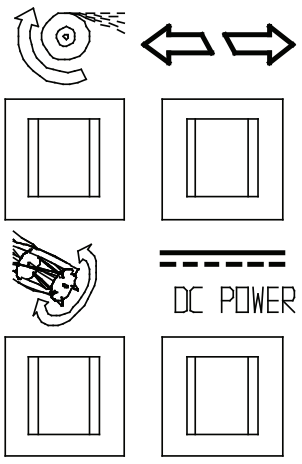
CONTROL BOX POWER SWITCH

Cuts power to all components in the control panel. Stops all motors, drives, power supplies, ect.

SWITCHING THE POWER TO OFF DOES NOT STOP ALL POWER TO THE GRINDER. POWER IS STILL DELIVERED TO THE SOME COMPONENTS IN THE COTROL BOX. DISCONNECT THE CORD AT THE WALL OUTLET BEFORE PERFORMING SERVICE.



CIRCUIT BREAKERS There are four circuit breakers located on the front of the control box. If they are tripped, the middle will pop out and a white bar will show. To reset, pess in on the middle of the circiut breaker. NOTE: These circiut breaker are thermaly activated and it may take a minute or two for them to cool off so they can be reset.



TOUCH DISPLAY SCREEN EXPLANATIONS

Review the following touch screen descriptions before proceeding with the instructions.

EMERGENCY STOP SCREEN

This screen is displayed when the Emergency Stop Button is pressed or the doors are opened while the machine is running. To reset, pull the E-Sop Button out and press the green start button.

MACHINE IS IN E-STOP
INSURE RED BUTTON IS PULLED OUT
RESET BY PRESSING GREEN BUTON
MACHINE IS IN E-STOP
Red background color.

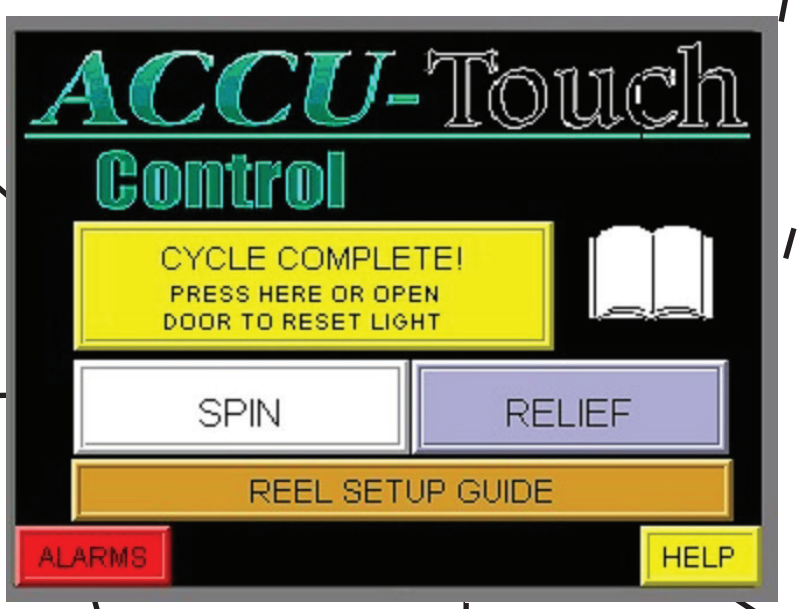
MAIN SCREEN

CYCLE COMPLETE:
When an auto program is complete the "Main" screen will be displayed along with this message.

BOOK:
Press to display general information on running this grinder. Note: These pages also come up when you first turn the power on.

SPIN:
Press to display the "Spin Manual" screen. This will allow you to manualy run the grinder for setup. This screen will also give you access to the screens needed to setup and run an auto program.

RELIEF:
Press to display the "Relief Manual" screen. This will allow you to manualy run the grinder for setup. This screen will also give you access to the screens needed to setup and run an auto program.

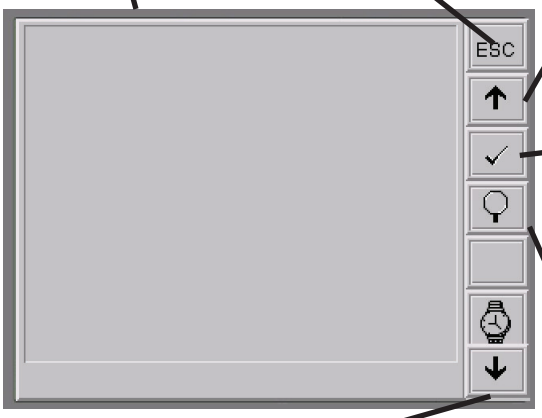


REEL SETUP GUIDE:
Press to display a guide for setting up a reel. For complete instructions refer to the Operators Manual.

HELP:
Press to display basic troubleshooting. This screen will also let you access some of the display settings and other functions.

ALARMS SCREEN

A blinking red bell in the upper right corner of any screen indicates an alarm. Press the alarm button located on that screen to display this "Alarms" screen. A message describing the problem will be displayed. If there is more than one problem they all will be displayed.



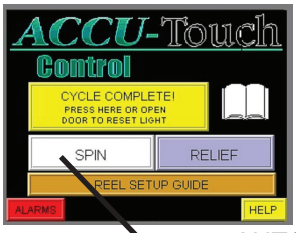
ESC: Press to return to the screen you were previously in.

UP ARROW: If there are a lot of alarm messages, use the up arrow to scroll through the different messages.

CHECK:
To remove an alarm message, highlight it by touching that line and press the "Check" button.

MAGNIFYGLASS:
Pressing this button will increase the size of the text. Pressing it multiple times will return the text to small charaters.

DOWN ARROW:
If there are a lot of alarm messages, use the down arrow to scroll through the different messages.



SPIN MANUAL SCREEN

Allows the operator to manually turn on the motors and move the grinding head for setup purposes or can be used to manually Spin grind a reel.

AUTO:
Press to display the "Spin Program Run" screen.

ALARMS:
When a flashing red bell appears in the right upper corner, press to display the "Alarms" screen.

SETUP:
Press to display the "Spin Program Grind Setup" screen.

DIRECTION:
Press to change the rotation direction of the spin motor. (Note: Most reels will run in the up position.)

VAC:
Press green area to turn vacuum system on. Press red area to turn off.

SPIN DRIVE:
Press green area to turn the spin motor on. Press red to turn off.

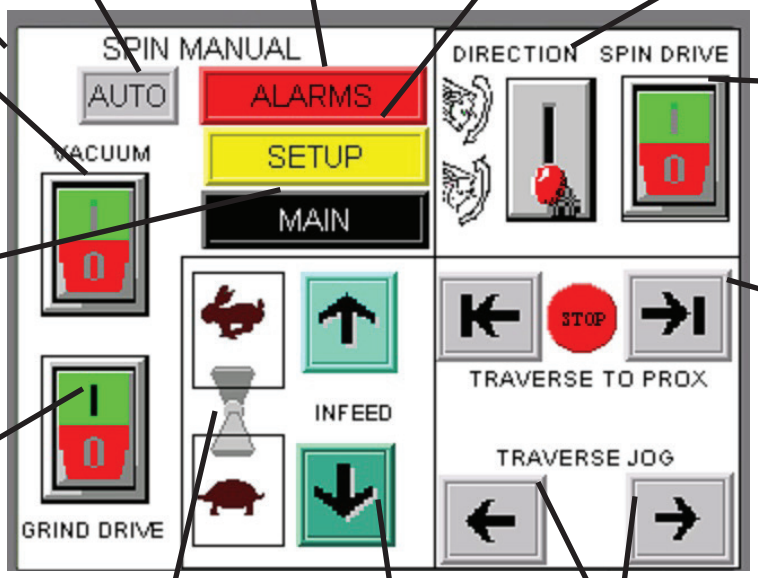
MAIN:
Press to display the "Main" screen.

TRAVERSE TO PROX:
Press arrow and grinding head will traverse in that direction until it reaches the prox. Press "Stop" to stop the grinding head before it reaches the prox.

GRIND MOTOR DRIVE:
Press green area to turn the grind motor on. Press the red area to turn it off.

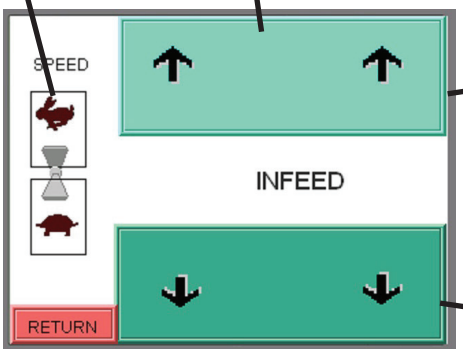
INFEED SPEED SELECTOR:
Press the rabbit if a fast infeed speed is needed. Press the turtle when a slower infeed is needed.

TRAVERSE JOG:
Press to traverse in the direction of arrow. The grinding head will stop when the button is no longer pressed.



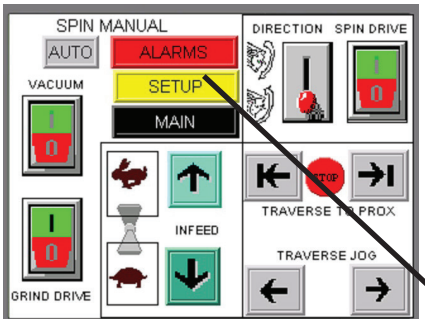
INFEED SCREEN

This screen comes up when you press the up or down infeed buttons. The large button format allows the operator to concentrate on the grinder without fear of touching the wrong button or slipping off the button.



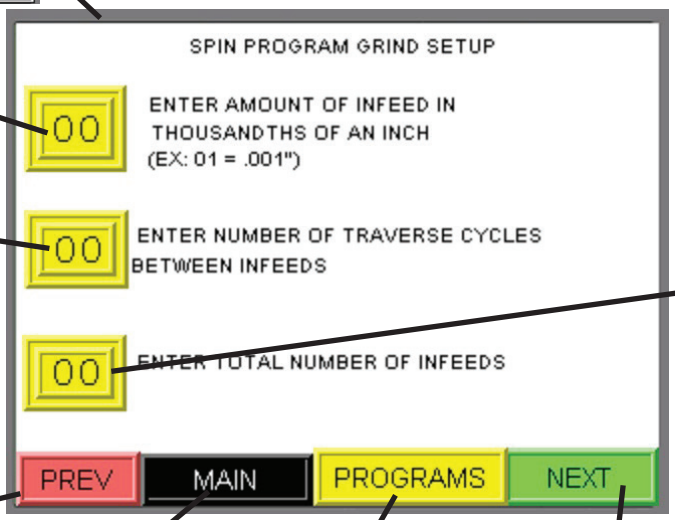
UP ARROW:
Press to infeed the grinding wheel. (This moves the grinding head up.)

DOWN ARROW:
Press to bring the grinding wheel down.



SPIN PROGRAM GRIND SETUP SCREEN

This screen allows the operator to enter an infeed amount, number of traverse cycles, and number of infeeds for an auto cycle.



INFEED AMOUNT:
Press to change infeed amount to that desired.

NUMBER OF TRAVERSE CYCLES:
Press to change the number of traverse cycles between infeeds. (A traverse cycle is one pass of the grinding wheel down and back.)

NUMBER OF INFEEDS:
Press to change the total number of times the grinding wheel will infeed during the auto cycle.

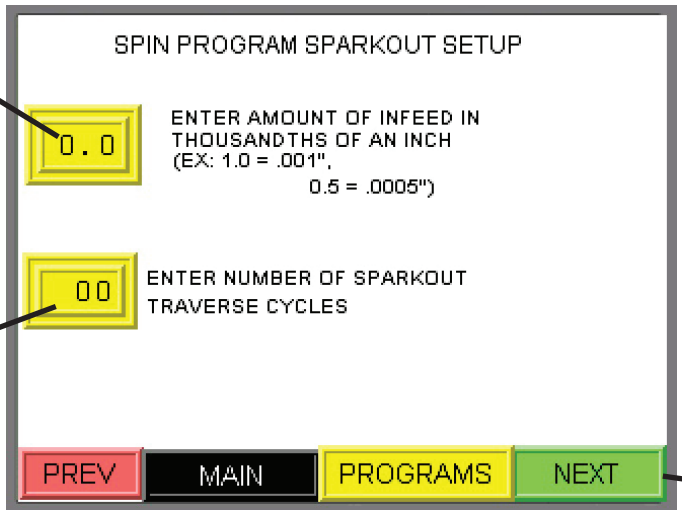
PREV:
Displays the previous screen.

MAIN:
Brings the "Main" screen.

PROGRAMS:
Displays the "Programs" screen.

SPIN PROGRAM SPARKOUT SETUP

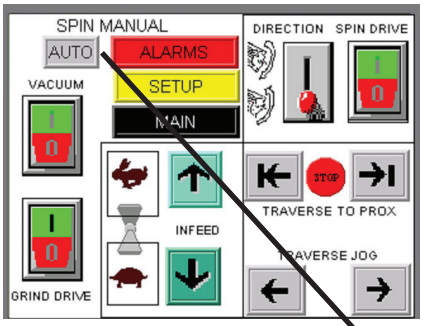
This screen allows the operater to change the values used in the sparkout cycle of an auto program.



SPARKOUT INFEED AMOUNT:
Press to change the amount the grinding wheel is infed at the beginning of the sparkout cycle of a program.

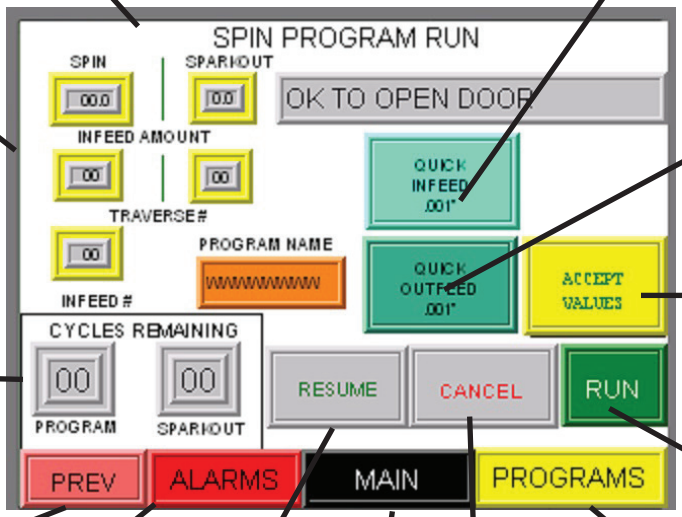
SPARKOUT TRAVERSE CYCLES:
Press to change the total number of traverse cycles for the sparkout cycle of a program.

NEXT:
Will display the "Spin Program Run" screen.



SPIN PROGRAM RUN SCREEN

This screen will appear if the Auto Button is pushed on the Spin Manual screen or after hitting Next on the Spin Program Sparkout Set-up Screen.



Settings Display Area: This area displays the settings chosen for the Auto Program Cycle. This area will flash until the "Accept Values" button is selected. If a program is selected the name and values of that program should be displayed here.

QUICK INFEED .001": This button allows the operator to infeed the grinding wheel .001" at any point in the program.

QUICK OUTFEED .001":This button allows the operator to outfeed the grinding wheel .001".

ACCEPT VALUES: Touch to accept the values located in the Settings Display Area.

CYCLES REMAINING: This will display the total number of Traverse Cycles remaining and the number of Sparkout Cycles remaining when a program is running.

RUN: Press to start the auto program.

PREV: Bring up the previous screen.

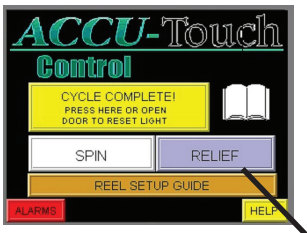
ALARMS: If a red alarm bell is blinking in the upper right corner, press to identify problem and to clear alarms.

PAUSE/RESUME: Will pause a program after the current traverse cycle is complete. Hit button again to Resume program.

MAIN: Displays the "Main" screen.

CANCEL: Will cancel the a paused program or cancel a running program after the current traverse cycle is complete.

PROGRAMS: Brings you to the "Programs" Screen. Press if you would like to load a new program or save the setting to a new program.



RELIEF MANUAL SCREEN

This screen allows the operator to manually turn on the motors and move the grinding head for setup purposes or can be used to manually relief grind a reel.

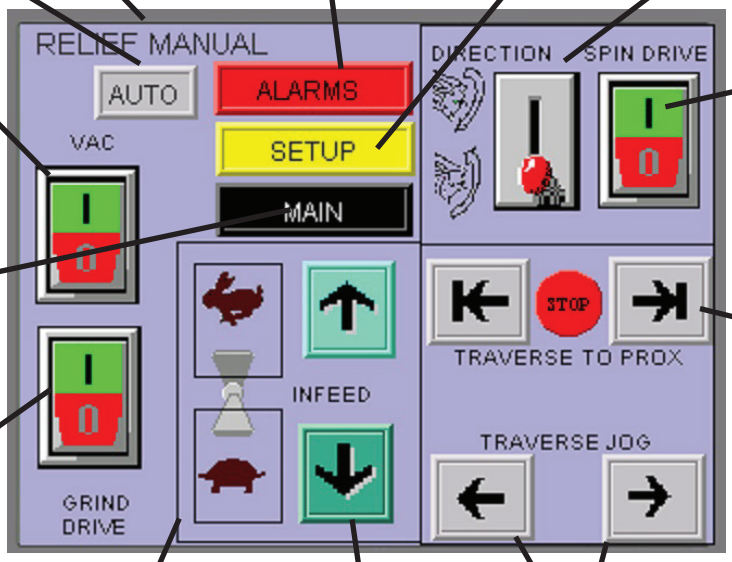
AUTO:
Press to display the "Relief Program Run" screen.

ALARMS:
When a flashing red bell appears in the right upper corner, press to display the "Alarms" screen.

SETUP:
Press to display the "Relief Program Setup" screen.

DIRECTION:
Press to change the rotation direction of the spin motor.

VAC:
Press the green area to turn the vacuum system on. Press the red area to turn it off.



SPIN DRIVE:
Press green area to turn the spin motor on. Press the red area to turn the motor off.

MAIN:
Press to display the "Main" screen.

TRAVERSE TO PROX:
Press arrow and grinding head will traverse in that direction until the prox is reached. Press "Stop" to stop the grinding head before the prox.

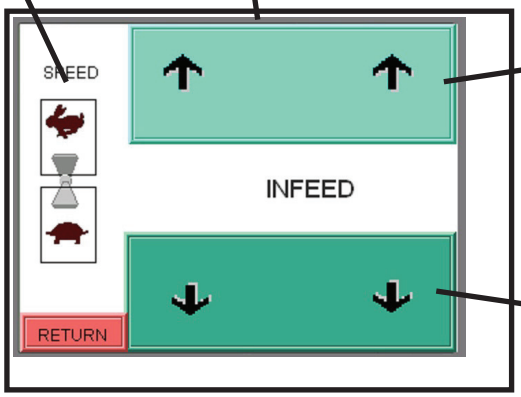
GRIND DRIVE:
Press the green area to turn the grind motor on. Press the red area to turn it off.

INFEED SPEED SELECTOR:
Press the rabbit if a fast infeed speed is needed. Press the turtle when a slower infeed is needed.

TRAVERSE JOG:
Press to traverse in the direction of the arrow. The grinding head will stop when the button is no longer pressed.

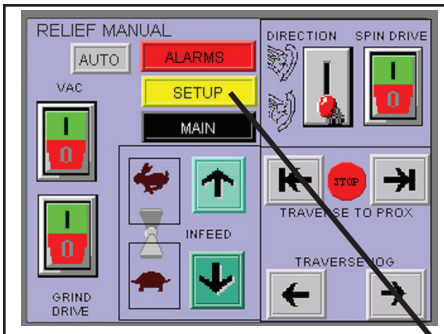
INFEED SCREEN

This screen comes up when you press the up or down infeed buttons. The large button format allows the operator to concentrate on the grinder without fear of touching the wrong button or slipping off the button.



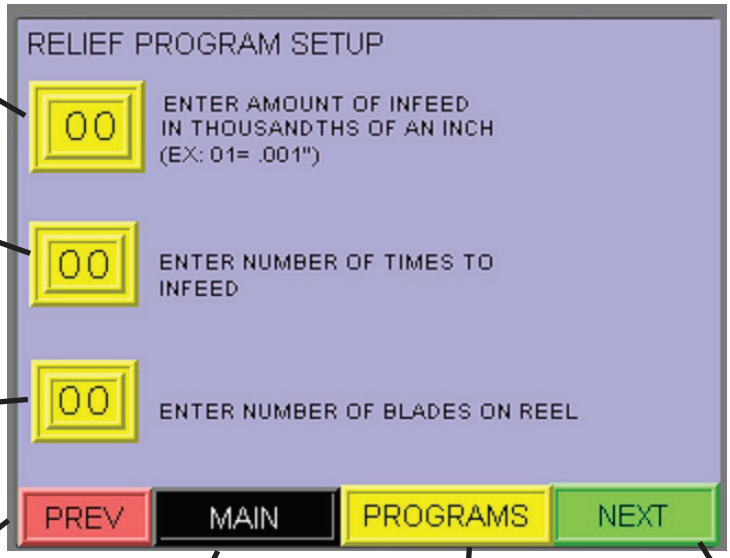
UP ARROW:
Press to infeed the grinding wheel. (This moves the grinding head up.)

DOWN ARROW:
Press to bring the grinding wheel down.



RELIEF PROGRAM SETUP SCREEN

This screen allows the operator to enter the settings needed to run an auto program in the relief mode.



INFEED AMOUNT:
Press to change the infeed amount.

NUMBER OF INFEEDS:
Press to change the number of times to infeed. Each blade will be ground once before it infeeds.

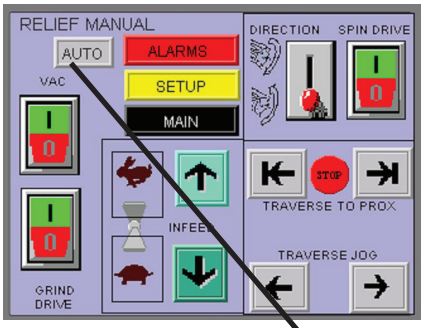
NUMBER OF BLADES:
Press to enter the total number of blades on the reel.

PREV:
Displays the previous screen.

MAIN:
Displays the "Main" screen.

PROGRAMS:
Displays the "Programs" screen.

NEXT:
Displays the "Relief Program Run" screen.



RELIEF PROGRAM RUN SCREEN

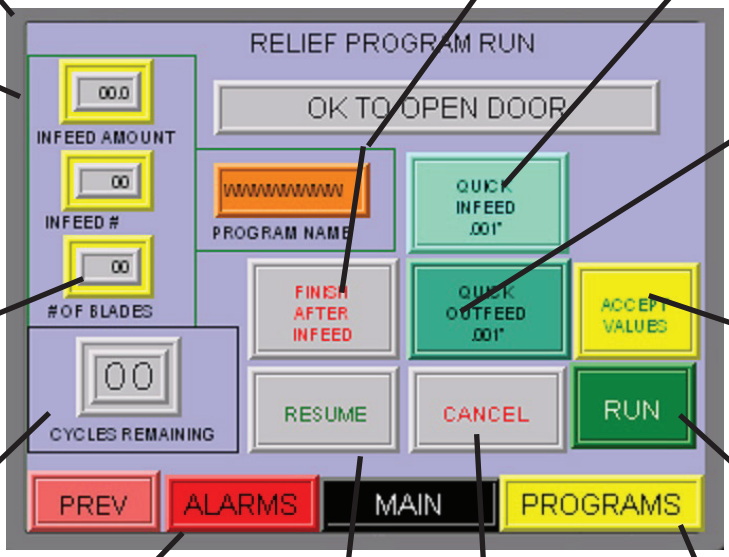
This screen will appear if the Auto Button is pushed on the Relief Manual screen or after hitting Next on the Relief Program Set-up Screen.

FINISH AFTER INFEED: Will end the current running or paused program after all the blades have been ground for that infeed.

QUICK INFEED .001": This button allows the operator to infeed the grinding wheel .001" at any point in the program.

QUICK OUTFEED .001": This button allows the operator to outfeed the grinding wheel .001".

SETTINGS DISPLAY AREA:This area displays the settings chosen for the Auto Program Cycle. This area will flash until the "Accept Values" button is selected. If a program is selected the name and values of that program should be displayed here.



ACCEPT VALUES: Touch to accept the values located in the Settings Display Area.

BLADE #: Press to change the blade number.

RUN: Press to start the auto program.

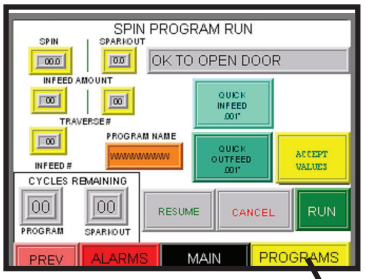
CYCLES REMAINING: This will display the total number of Traverse Cycles remaining when a program is running.

ALARMS: If a red alarm bell is blinking in the upper right corner, press to identify problem and to clear alarms.

CANCEL: Will cancel the a paused program or cancel a running program after the current traverse cycle is complete.

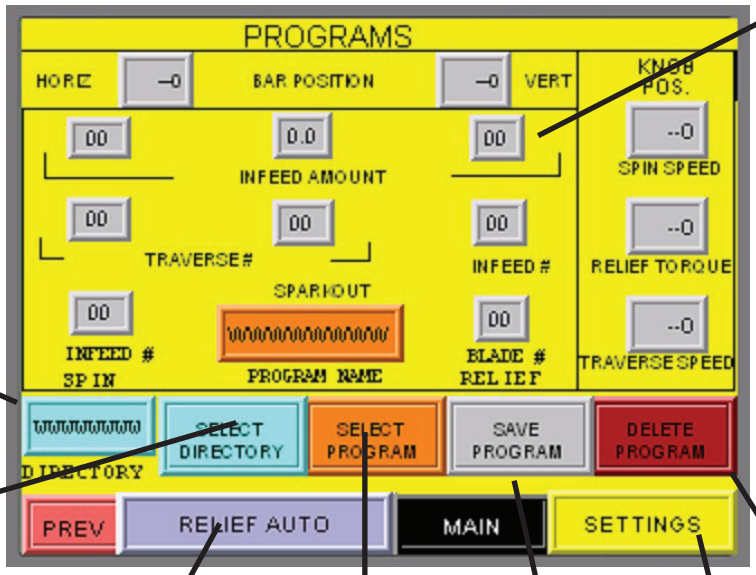
PAUSE/RESUME: Will pause a program after the current traverse cycle is complete. Hit button again to Resume program.

PROGRAMS: Brings you to the "Programs" Screen. Press if you would like to load a new program or save the setting to a new program.



PROGRAMS SCREEN

This screen shows the directory and values currently stored to be used for the auto program cycle for both spin & relief.



SETTINGS DISPLAY: Shows all settings stored for a program. If information is entered in the "Spin Program Setup", "Spin Program Sparkout Setup", or "Relief Program Setup" screen, that information will be displayed. NOTE: If an item is changed, in one of the above screens, the new data will be displayed but will not be saved unless the "Save Program" option is used.

DIRECTORY: Displays the current directory; "Default" or "Custom".

SELECT DIRECTORY: Allows the operator to choose between the "Default" or "Custom" directory. The Default directory contains factory programs and cannot be changed or deleted. The Custom directory allows the operator to create and save a custom program.

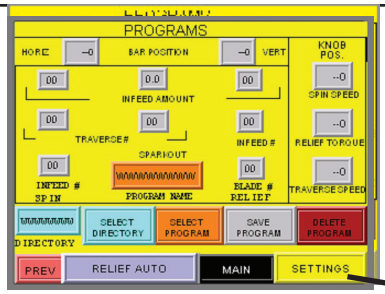
SPIN/RELIEF AUTO: Press to display the "Spin Program Run" screen or the "Relief Program Run" screen. Note: This is dependant on the position of the Finger and Body Assembly of the grinding head.

SELECT PROGRAM: Press to display a list of programs in the current directory.

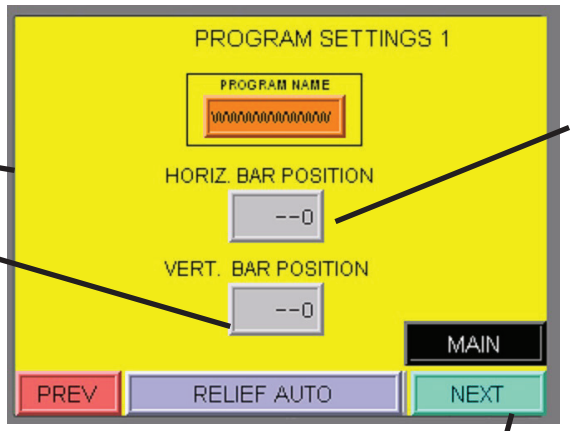
SAVE PROGRAM: Press to save the displayed setting. This button will only be displayed when the "Custom" directory is selected.

DELETE PROGRAM: Press to delete a program. This button will only be displayed when the "Custom" directory is selected.

SETTINGS: Press to display the "Program Settings 1" screen.



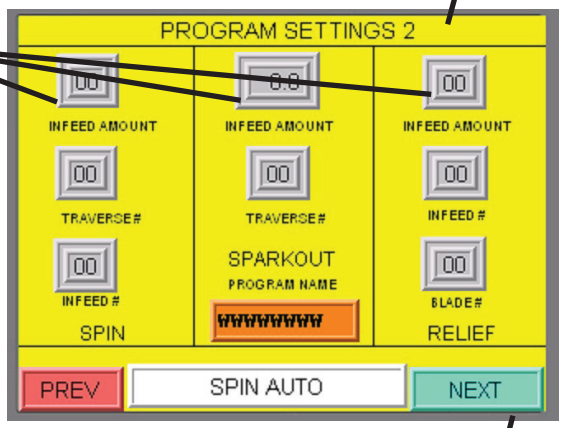
PROGRAM SETTINGS SCREENS:
These screens allow the operator to enter or change the settings for a program.



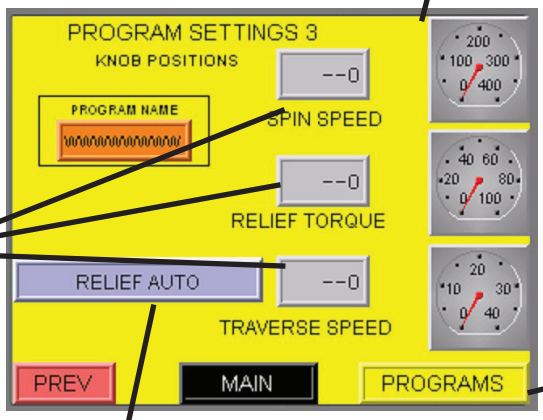
HORIZONTAL BAR POSITION:
Press to enter the position on the Horizontal Bar. Note: This is for operater reference and is not needed to run the program.

VERTICAL BAR POSITION:
Press to enter the position on the Vertical Bar. Note: This is for operater reference and is not needed to run the program.

PROGRAM SETTINGS:
Press any box to change the dispayed number.

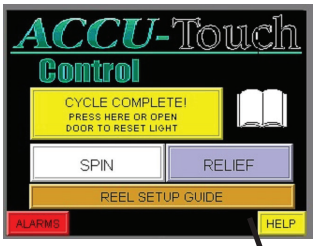


POT SETTINGS:
Press to enter the pot settings used during the program. Note: This is for operater reference and is not needed to run the program.



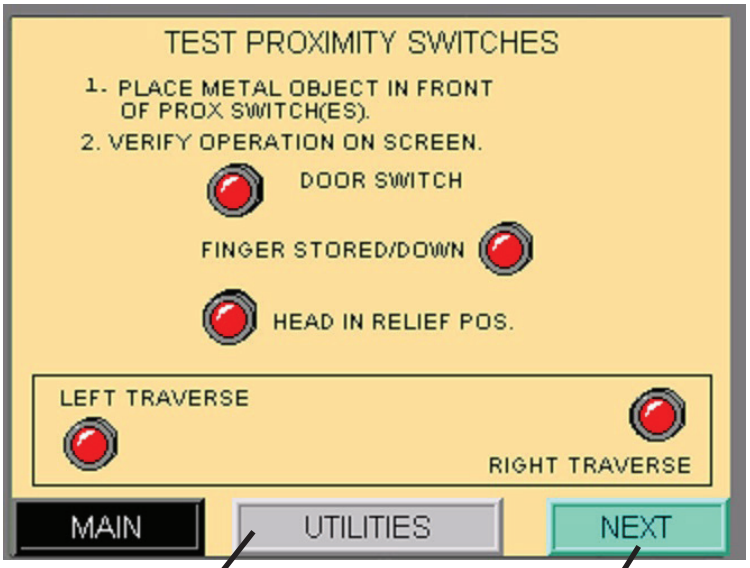
PROGRAMS:
Press to return to the "Programs" screen to save the changes.

SPIN/RELIEF AUTO:
Press to go the Spin/Relief run screen to run the program.

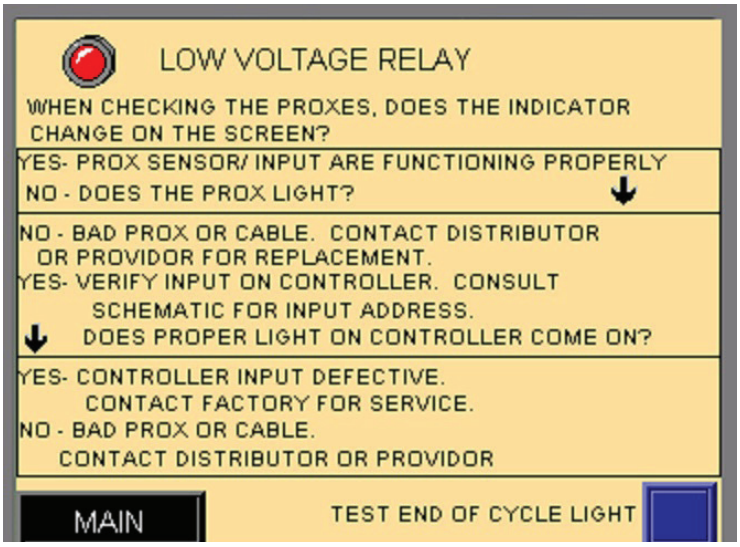


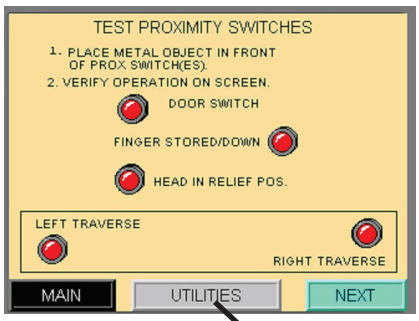
HELP SCREEN

This help screen will assist in verifying that the proximity switches are working correctly. With this screen displayed, place a metal object in front of the proximity switch in question. The light on the proximity switch should come on and the symbol next to the prox on this screen should turn from grey to red. If the symbol does not turn red, then the prox is not fuctioning properly and more analysis is needed. If this is the case press the "Next" and follow the instructions or consult the Assembly & Service Manual.



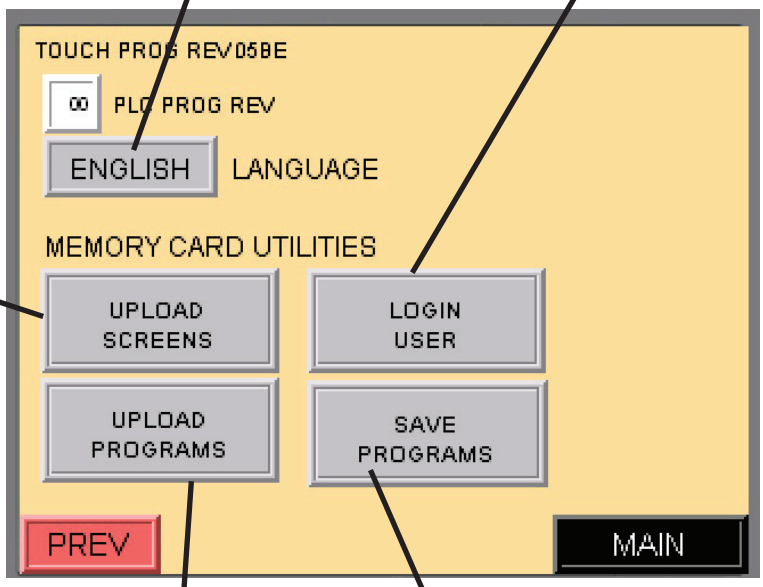
UTILITIES:
Displays the "Utilities" screen. (See next page.)


LOW VOLTAGE RELAY
WHEN CHECKING THE PROXES, DOES THE INDICATOR CHANGE ON THE SCREEN?
YES- PROX SENSOR/ INPUT ARE FUNCTIONING PROPERLY
NO - DOES THE PROX LIGHT?
NO - BAD PROX OR CABLE. CONTACT DISTRIBUTOR OR PROVIDOR FOR REPLACEMENT.
YES- VERIFY INPUT ON CONTROLLER. CONSULT SCHEMATIC FOR INPUT ADDRESS.
DOES PROPER LIGHT ON CONTROLLER COME ON?
YES- CONTROLLER INPUT DEFECTIVE. CONTACT FACTORY FOR SERVICE.
NO - BAD PROX OR CABLE. CONTACT DISTRIBUTOR OR PROVIDOR
MAIN
TEST END OF CYCLE LIGHT



LANGUAGE:
Press to select from the list of languages. Choosing a language will change the text in most screens to that language.

LOGIN USER:
Press and enter password to gain access to the utilities listed to the left.



UPLOAD PROJECT:
Press to upload a project from the memory card. The project contains the information for the screens on the touchscreen. A password is needed for this function. Contact the factory if this function is needed.

UPLOAD PROGRAM:
Press to upload grind programs from a memory card. This can be used to transfer programs from one machine to a new one. A password is needed for this function. Contact the factory if this function is needed.

SAVE PROGRAM:
Press to save grinding programs to the memory card. A password is needed for this function. Contact the factory if this function is needed.

FRONT AND REAR MOWER MOUNTING

The mowing unit is placed into the machine with the rear roller on the table and front roller held with the front tooling clamps. The front tooling clamps can be moved from side to side along the tooling bar so they can be positioned as far apart as possible on varying widths of reels (loosen knob A on lower part of bar mounting bracket in FIG.1). You also have the ability to adjust the height (loosen knob B on horizontal bracket in FIG.1) and the forward and backward position (loosen knob C on roller clamp bracket in FIG.1). This allows the mower unit to be set up with the bottom of the reel approximately flush to the table and the center of the reel aligned to the reel positioner gage (see section on reel positioner gage below). When the front tooling clamps and mowing unit are in proper position, lock in place by hand tightening knobs. The rear roller clamp is positioned with the V-clamp block centered on the rear roller. The height of the rear roller clamp can be adjusted down by simply pushing the unit down and adjusted up by first pulling up on the release lever and then sliding the unit up. To lock the front tooling clamps rotate the roller clamp up and lock in place with the quick release pin. There are two mounting holes for the quick release pin, one hole set at vertical and the other at approximately 8 degrees. For the majority of mowing units, the hole set for vertical clamping can and should be used. For some mowing units, a frame part causes difficulty with using the vertical hole set, then use the 8 degree hole set which allows additional clearance as shown in FIG. 1. Then turn the t-knobs clockwise until roller is firmly held in place.

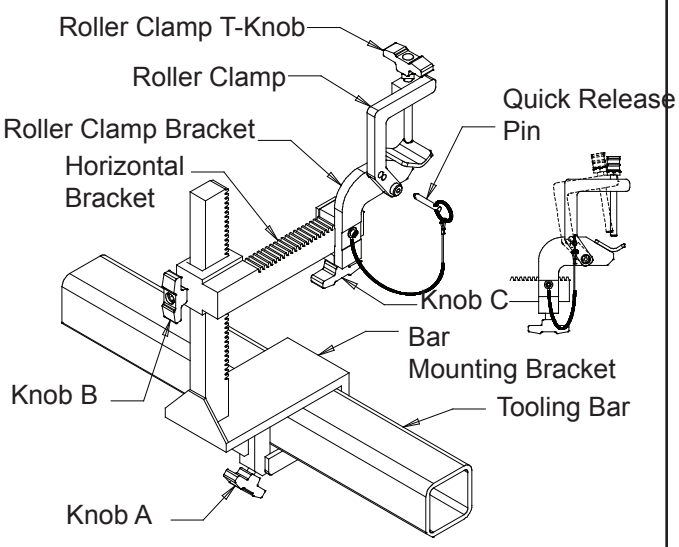


FIG. 1

HAND TIGHTEN T-KNOBS ONLY. DO NOT WRENCH TIGHTEN OR BRACKETS CAN BE BENT.

REEL POSITIONER GAGE

The Reel Positioner Gage is used to obtain proper in and out (fore and aft) positioning of the mower unit. Mount the Reel Positioner Gage onto the table with the ears butted against gaging surface of the table. See FIG. 2. You then position the center of the reel within the slot in the Positioner Gage. This is an approximate starting point for setup purposes. There are special reels and unique situations that may require the reel to not be set on the center of the flag. This flag is for setup reference only.

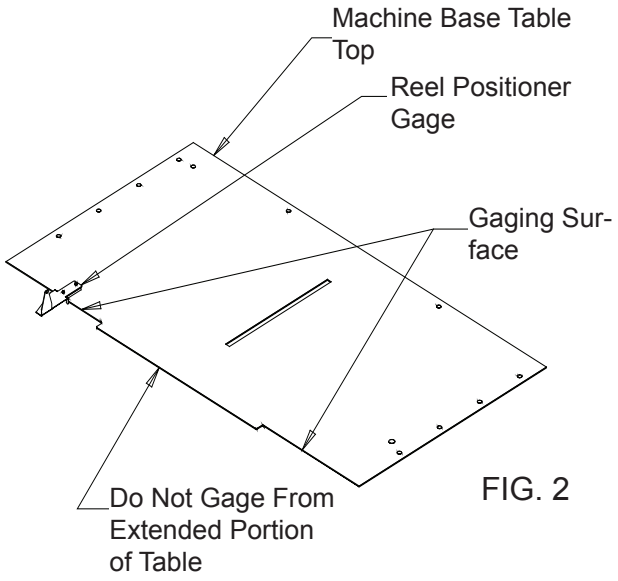


FIG. 2

TRAVERSE ACTUATOR RELEASE

The belt that drives the grinding carriage left and right can be released to allow manual movement of the grinding carriage. The clamp release arm is located at the front of the carriage under the Carriage Proximity Flag Bracket. See FIG. 3 Rotate the release arm up to release actuator and down to engage actuator.

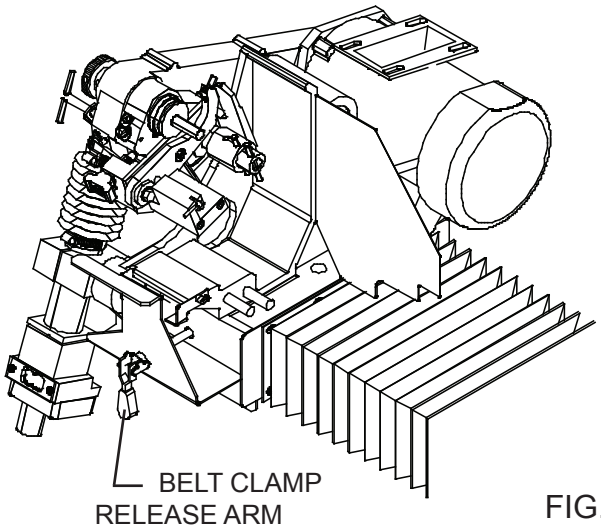


FIG. 3

TRAVERSE PROXIMITY SENSORS

The Traverse Proximity Sensors are used to change the traversing directions for the grinding carriage and are mounted in the brackets located at the front of the Traverse Base. See FIG. 4. The sensors are mounted with wave washers to allow a left and right sliding movement without loosening the sensor nuts. There is a light on the sensor which lights up when the switch is activated.

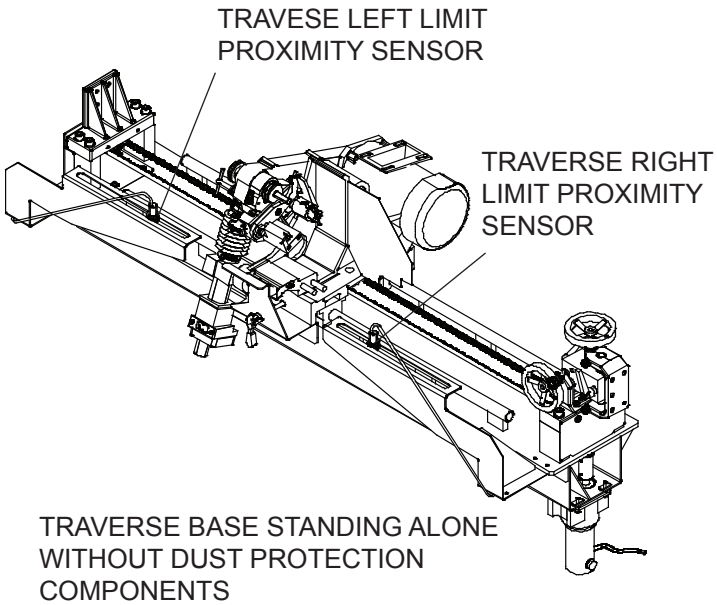


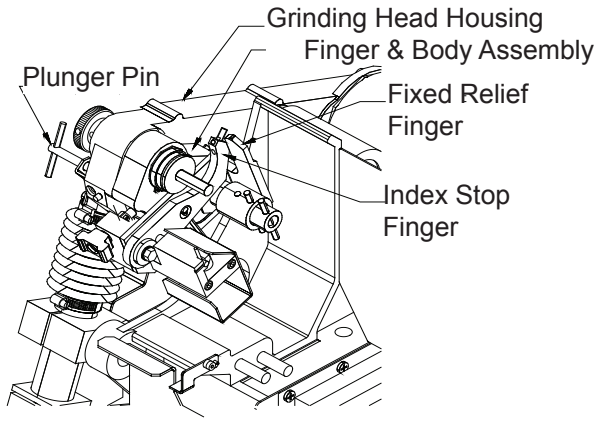
FIG. 4

GRINDING HEAD POSITIONS SPIN/RELIEF

The Finger and Body Assembly of the grinding head rotates on the Grinding Head Housing to change positions between spin grinding and relief grinding. To change the position of the Finger and Body Assembly you have to pull out the Plunger Pin on the left side of the Grinding Head Housing. See FIG. 5. When you are going to perform spin grinding operations the Finger and Body Assembly must be rotated clockwise (looking at it from the right). This rotates the fingers out of the reel blade path. See FIG. 5. When you are going to perform relief grinding operations the Finger and Body Assembly must be rotated counter clockwise. This rotates the finger into position to touch and control the reel blades. The Plunger Pin engages into the Relief Adjuster. See FIG. 6. Sometimes the Plunger Pin will not fully engage into the Relief Adjuster, so make certain it is fully engaged. See FIG. 10.

INDEX STOP FINGER ADJUSTMENTS

The Finger and Body Assembly includes two fingers. See FIG. 5. The Fixed Relief Finger is equivalent to the Relief Fingers on other relief grinders. When relief grinding, the movable Index Stop Finger moves from the Relief Finger Side (back side) of the reel blade when traversing from right to left, to the grinding wheel side (front side) of the reel blade when traversing from left to right. This feature allows the fully Automatic Relief function. When performing relief grinding operations it is important to have the Index Stop Finger adjusted properly.



Detail shows Finger and Body Assembly rotated (clockwise) into the spin grinding position (shown without grinding wheel for clarity).

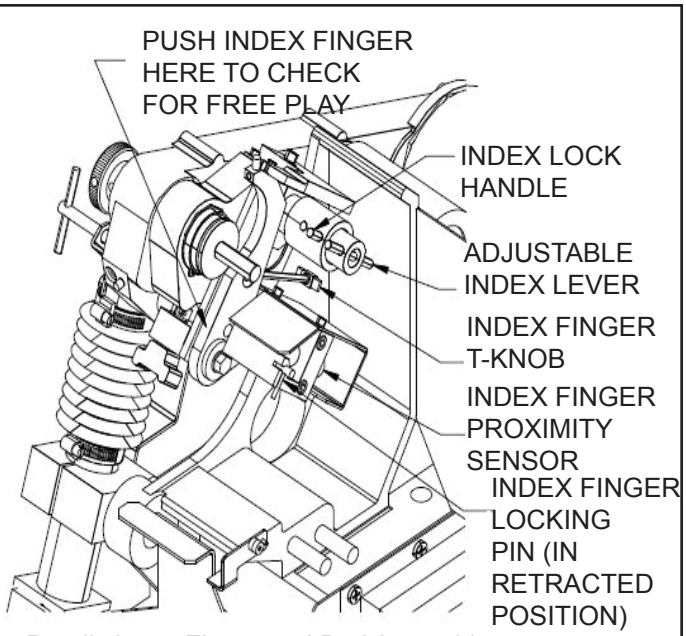
FIG. 5

STEP 1: Once you have the Grinding Head positioned with a reel blade resting on the Fixed Relief Finger high point, you want about 1/32" [.8 mm) to 1/16" [1.5 mm] free play of the Index Finger behind the reel blade. The Index Stop Finger is spring loaded to the up position. To check free play, push down on the Index Stop Finger. See FIG. 6. To make this adjustment you have to first turn the Index Lock Handle counter clockwise to unlock the adjustable Index Lever. See FIG. 6. If there is no free play of the Index Finger you want to rotate the Adjustable Index Lever clockwise. If there is more than 1/16" [1.5 mm] free play you want to rotate the Adjustable Index Lever counter clockwise. When the Index Stop Finger is in proper position rotate the Index Lock Handle clockwise to lock the Adjustable Index Lever. The Index Stop Pin is height adjustable. It should be adjusted to catch the reel blade and still leave enough clearance to the reel spider after the relief is ground to the depth required.

NOTE: The reason for the 1/32" (1 mm) clearance is so the high point of the Relief Finger is acting as the guide during the relief grind cycle. The Index Stop Finger acts as a guide onto the tapered ramp of the Relief Finger.

STEP 2: With the down limit of the Index Stop Finger properly set you may have to adjust the up limit of the Index Finger for 5" (127 mm) diameter reels with reverse helix blades. The up travel limit is restricted to keep the Index Finger in the reel blade index path. This is done to properly catch the next blade when indexing or to allow clearance between the back side of the Index Stop Finger and the front side of the blade when the grinding carriage is making its return trip to the home position.
If the Index Stop Finger has problems catching the next blade turn the Index Finger T-knob counterclockwise. If there isn't enough clearance between the back side of the Index Stop Finger and the front side of the reel blade turn the Index Stop Finger T-knob clockwise. See FIG. 6.
Adjust the T-knob in by 1/8" (3 mm) into the hole opening so the up travel is restricted. Check the up and down swing of the Index Finger for clearance on both sides of the reel blade for the relief grind.

NOTE: This adjustment is factory set for maximum up travel of the index finger for 1/4" (6 mm) reel blade thickness. This adjustment should only be needed for small diameter reels, such as 5" [127 mm] diameter reels with reverse helix blades. This adjustment is functional only on cutting units with thin blades on small reels.


PUSH INDEX FINGER HERE TO CHECK FOR FREE PLAY
INDEX LOCK HANDLE
ADJUSTABLE INDEX LEVER
INDEX FINGER T-KNOB
INDEX FINGER PROXIMITY SENSOR
INDEX FINGER LOCKING PIN (IN RETRACTED POSITION)

Detail shows Finger and Bed Assembly rotated counterclockwise into relief grinding position (shown without grinding wheel for clarity

FIG. 6

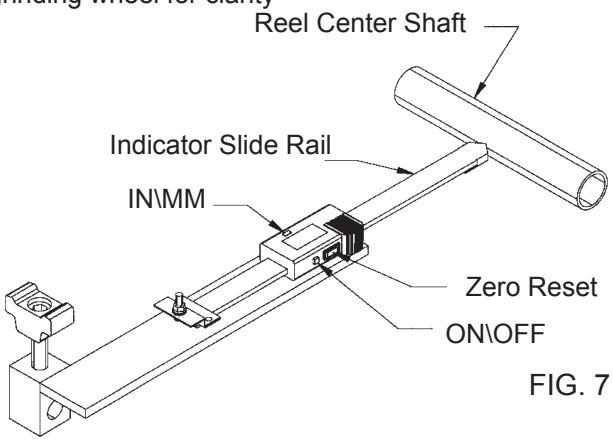


FIG. 7

ALIGNMENT GAGE

A properly ground reel should be cylindrical. All taper must be ground out of the reel. To ensure the reel will be ground correctly it MUST be aligned precisely prior to grinding. The digital alignment gage is used for accurate reel setup. The same gage is used for setting both the horizontal and vertical alignment within thousands of an inch. The digital gage allows you to measure one end of the reel by extending the slide rail until you make contact with center hub of the reel. See FIG. 7. You then reset the gage to zero, retract the slide rail and measure the other end of the reel. The reading on the digital scale tells you exactly how far out of alignment you are. NOTE: Gage can be set for both inch and metric readout. The digital gage reads to .0001. Alignment requires an accuracy of .0020. Therefore disregard the fourth decimal place.

DUST COLLECTOR

The dust collector unit is used during grinding operations to collect the majority of the grinding dust directly under the grinding wheel. Since the dust collector unit is actually an industrial vacuum you can disconnect the vacuum hose from the carriage base and use the vacuum to clean the entire machine. See FIG. 8.

FIG. 8

NEVER USE COMPRESSED AIR TO CLEAN ANY AREA OF THE MACHINE.

RELIEF ANGLE ADJUSTMENT

You should always make sure the Mico Adjuster for Relief Angle is at its mid point before you set up a reel to grind. See FIG 10. This will allow to adjust the relief angle by approximately 8 degrees in both directions. You can find the mid point by turning the Mico Adjuster clockwise, using the 5/16" Allen Key included with the grinder, until it makes contact with the stop pin. Then turn the Mico Adjuster counterclockwise until it makes contact with the stop plate counting the number of revolutions. Now turn the Mico Adjuster clockwise again 1/2 the number of revolutions you counted.

As an example, if the angle you obtain from initial set up is 30 degrees, you can increase the angle as far as approximately 38 degrees by rotating the Micro Adjuster clockwise until it makes contact with the stop pin. (NOTE: If 38 degrees is not enough relief angle you can move the reel forward one notch on the front tooling horizontal bracket. Make sure you reset the Micro Adjuster to the mid point again before you move the reel, and always realign reel if it is moved. You can decrease the angle as far as approximately 22 degrees by rotating the Micro Adjuster counterclockwise until it make contact with the stop plate. (NOTE: If 22 degrees is still to much relief angle, you can move the reel back one notch on the front tooling horizontal bracket.)

MICRO ADJUSTER
FOR RELIEF ANGLE

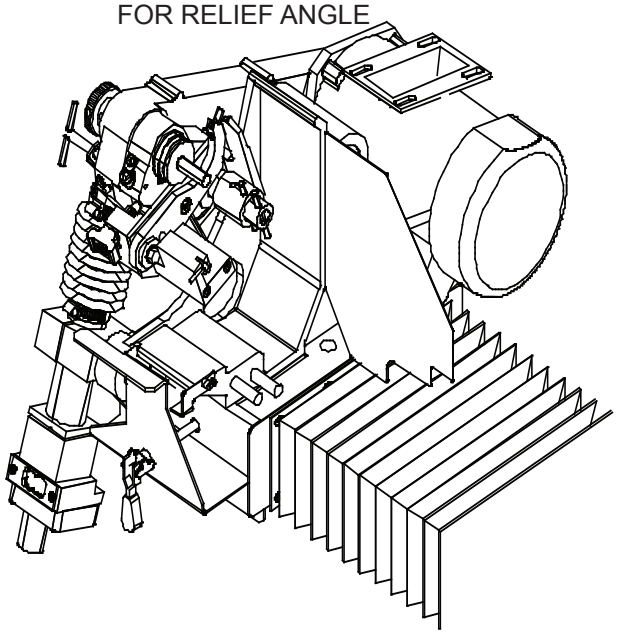


FIG. 10

PREPARE MOWING UNIT FOR SHARPENING

When preparing a cutting unit for sharpening, follow the cutting unit manufacturers recommendations for proper maintenance. It is recommended that the reel to be sharpened is thoroughly cleaned. Remove wheels and bed bar, if possible, from the reel. **All bedknives must be ground when reels are sharpened.** Inspect, adjust and/or replace any worn or damaged bearings. Make sure reel bearings are adjusted properly so the reel turns easily by hand.

Because this grinder mounts the reel using the rear roller and front roller if applicable, the bearings must be in good repair with no freeplay. **The front and rear rollers must be properly aligned parallel to the reel prior to grinding.**

FIG. 11a

REELS WITH EXCESS TENSION ON THE BEARINGS WILL BE EXTREMELY DIFFICULT TO SPIN GRIND AND COULD CAUSE DAMAGE TO THE REEL OR THE SPIN DRIVE MECHANISM ON YOUR GRINDER. NO MORE THAN 25 IN-LBS MAXIMUM TORQUE LOAD TO ROTATE THE REEL IS ALLOWED OR DAMAGE TO THE SPIN DRIVE COULD OCCUR.

LIFTING REEL INTO POSITION

Boom Model

Position the reel in front of the grinder on the floor so the front of the mower faces in the same direction as the front of the machine. See FIG. 11a Hook the winch spreader bar onto the reel. The clamps on the spreader bar should be spaced evenly along the mower, so they do not slide as the mower is being raised. For the 632, stand between the mowing unit and the winch and raise the mowing unit into place. For walking greensmowers, position the mowing unit so the handle points toward the winch. Then stand between the mowing unit and the grinder frame to winch the mowing unit to height. Then walk around the mowing unit and guide it into position.

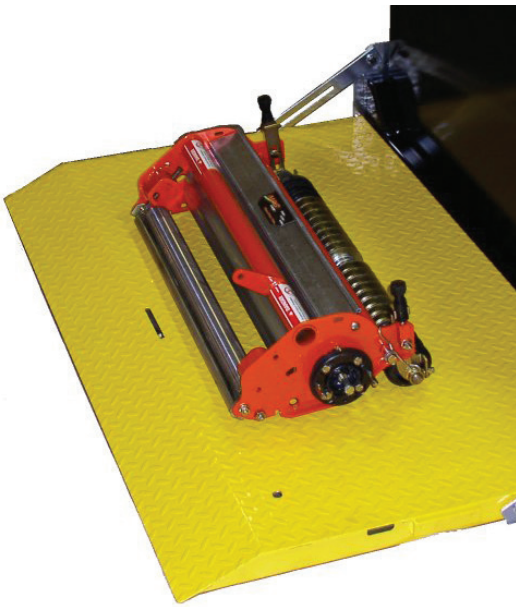


FIG. 11b

THE OPERATOR SHOULD BE POSITIONED AWAY FROM THE REEL. DO NOT STAND UNDERNEATH THE REEL AS IT IS BEING RAISED. GUIDE REEL AT ARMS LENGTH.

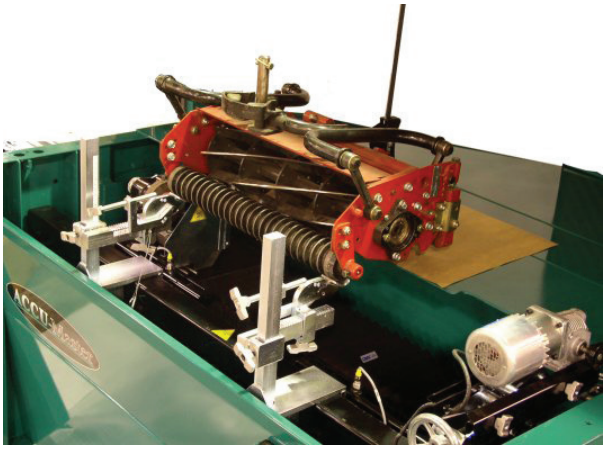


FIG. 12

Optional Workstation for the 632

Lift or roll the reel onto the rear ramp so the front of the mower faces towards the front of the machine. See FIG. 11b. Raise the workstation ramp until the ramp is even with top of the table. Move the reel onto the grinder table top, then close the rear ramp.

ELECTRIC WINCH (OPTIONAL ON 632)

This unit is activated via the switch at the end of the one foot cord. To remove wire rope from the winch, depress the "CABLE OUT" button. The load will stop without coasting when the button is released. To pull a load or spool wire rope onto the drum, depress the "CABLE IN" button.

This winch is designed to pull 400 lbs (180 KG) for 20 second on the wire rope layer closest to the drum. Attempts to pull more than this weight or exceed the duty cycle (on time) may cause damage to the winch or wire rope. I may also cause the circuit breaker to trip, and the winch will not operate. Maintain a minimum of four wraps of wire rope around the winch drum before attempting any pulls.

DO NOT PUT ANGULAR LOADS ON THE WINCH. PULL SHOULD ALWAYS BE PERPENDICULAR TO WINCH.

KEEP WIRE ROPE TIGHT AND EVEN ON THE SPOOL.

REPLACE WIRE ROPEWHEN FRAYED.

KEEP WIRE ROPE UNDER TENSION WHEN OPERATING WINCH. WIRE ROPE WILL "STACK UP" LOOSELY ON SPOOL IF NOT KEPT UNDER TENSION.

The wire rope will require periodic attention and eventual replacement. Inspect the wire rope frequently. If any fraying exists, replace the wire rope at once. Your winch uses a galvanized aircraft type 1/8" DIA. [3 mm] 7 x 19 cable. Always replace the wire rope with the replacement rope specified in the parts section of this manual. Because all rope is subject to wear, it is excluded from our warranty.

LUBRICATION

Your new winch has a lifetime lubrication. Grease leakage out of the winch, especially during the first few operations, this is normal. It is not necessary to grease or oil any part of the winch at any time. If grease leakage continues beyond a short period of time, the winch should be inspected for cause, and replaced if necessary.

TROUBLESHOOTING

If the winch fails to operate, the circuit breaker on the end of the winch motor should be checked. If the circuit breaker has tripped, this will be indicated by the center portion of the breaker protruding from the main body. To reset the breaker, merely press the center portion back into the assembly.

OPTIONAL WORKSTATION

This OPTIONAL WORKSTATION has been designed to lift a maximum of 400 lbs (180 KG) once every 10 minutes. Attempts to lift more than this weight or exceed the duty cycle (on time) may cause the circuit breaker to trip, and the lift will not operate.

For detailed information on the OPTIONAL WORKSTATION, see the manual included with the Workstation.

NEVER USE THE WORKSTATION WITH A PERSON ON THE RAMP.

NOTE: Repeated tripping of the breaker indicates an overload condition. Overloading will shorten the life of your winch.

INSTALL REEL

Move the reel to the approximate grinding position, having the rear roller on the table top, and front roller on front roller. See FIG. 12.

MAKE SURE THE GRINDING WHEEL IS LOW ENOUGH TO CLEAR THE REEL. YOU CAN LOWER THE GRINDING WHEEL BY GOING TO EITHER SPIN OR RELIEF MANUAL SCREEN AND PRESS INFEED DOWN BUTTON. SEE FIG. 31.

Position front roller clamps as far out as possible to the end of the front roller, and center on the machine. See FIG. 12

Set the vertical height of the front clamps so the reel bottor is flush to 3/8" [10 mm] above the table surface. See FIG. 13

Set the horizontal position of the front roller clamps with th reel Positioning Gage. Place the reel positioner gage agains gaging surface. See FIG. 14. You want to align the center c the reel within the slot of the positioner gage.

THE HORIZONTAL SCALES AND VERTICAL TOOLING SCALES MUST MATCH FOR PROPER ALIGNMENT.

For greensmower reels, the 3.5" [89 mm] diameter grinding wheel must clear the front roller clamps by approximately 1/4" [6 mm]. **REFER TO PAGE 50 FOR SETUP CHART.**

To insure that your setup is correct for spin and relief, put the relief (narrow) grinding wheel on the grinder. Position the relief finger system into the relief position. Jog the head up and trap the reel blade between the grinding wheel and the relief finger. Check clearance between the grinding wheel and the front roller. Also check the clearance between the grinding wheel and the next blade. If good, check the relief angle on the reel blade. Refer to page 29 for adjustment of relief angle.

Make certain the reel is parallel to the front edge of the table. Lock down with front clamps and rear clamp. The front clamps have two positions as described on page 26. Use the vertical position when ever possible. See FIG. 15 &16.

FIRMLY HAND TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

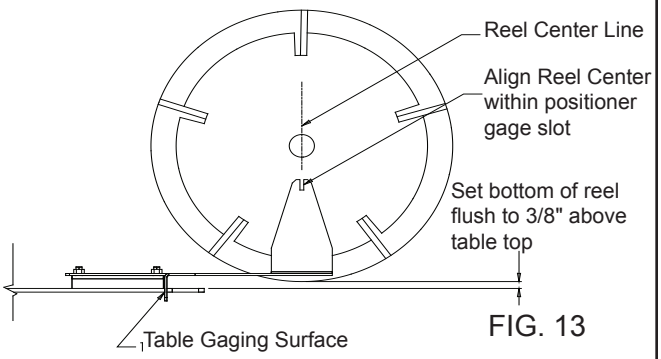

Reel Center Line
Align Reel Center within positioner gage slot
Set bottom of reel flush to 3/8" above table top
Table Gaging Surface

FIG. 13

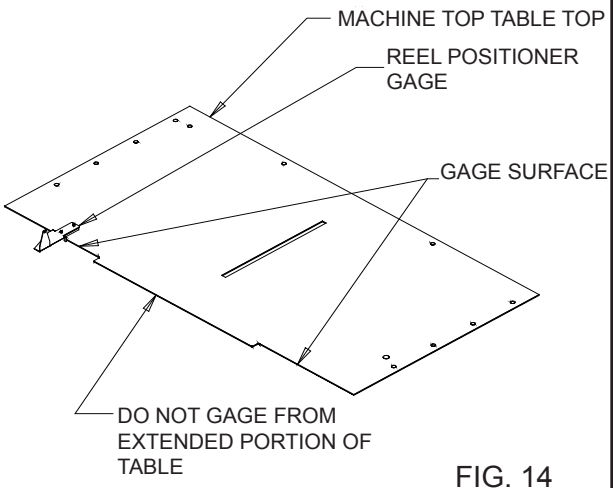


FIG. 14

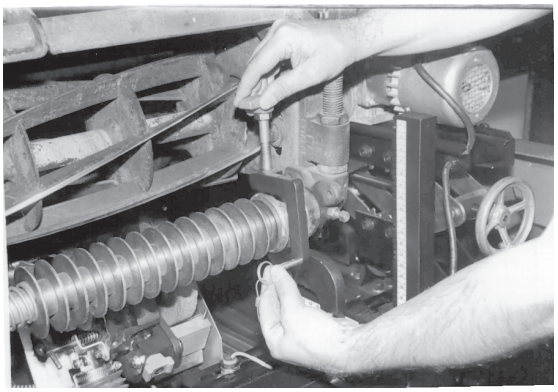


FIG. 15

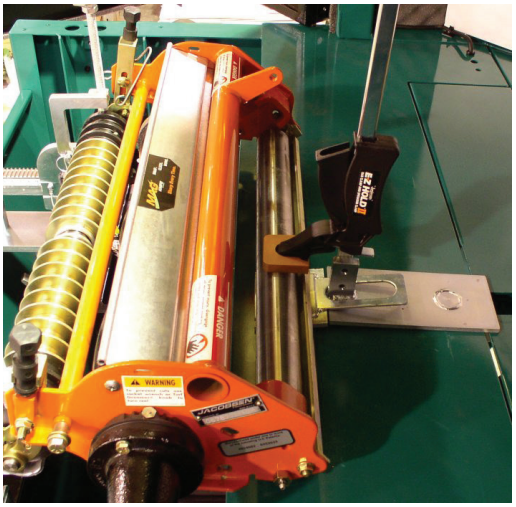


FIG. 16

ALIGN THE REEL

Note: When measuring to the reel center shaft always make sure you are contacting an area free of dirt and grass.

HORIZONTAL ALIGNMENT

Install the horizontal extension bracket onto the carriage front dowel pin and lock in place with knob. See FIG. 17.

Install the digital alignment gage onto the horizontal extension bracket pointing at the center of the reel shaft and lock into place with knob. See FIG. 18.

NOTE: The horizontal extension bracket is vertically adjustable so the digital gage can be positioned to avoid reel frame members, etc. The mounting of the vertical slide to the horizontal weldment has two additional mounting holes so the vertical slide can be tipped forward or back, again to avoid reel frame members, etc. See FIG. 17.

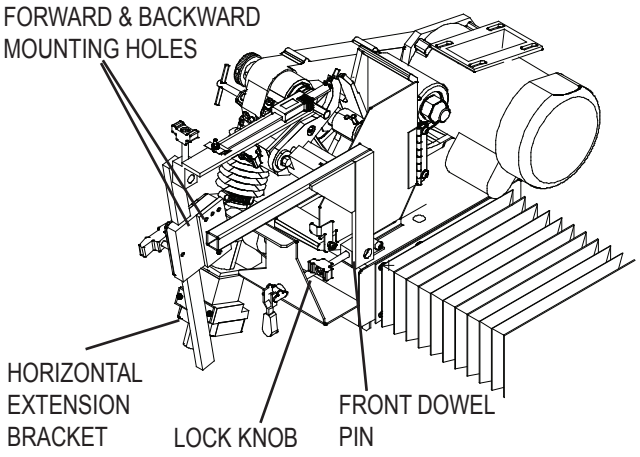


FIG. 17

Loosen the two locking handles on the pivot assembly on the right side of the traverse base, so that it can be adjusted in both the vertical and horizontal plane. See FIG. 19.

First, measure the left side of the reel as far to the left as possible with the digital alignment gages, making sure the tip of the gage is centered on the reel center shaft. Set the gage to zero, then measure the right side at the same distance from reel centerline as the left side. Do not rotate the reel shaft except for a minimum amount to clear the gage when taking measurements. First note the amount the reel is out of alignment. Then, with the digital gage still on the right side of the reel, turn the orange horizontal handwheel in the direction required until the gage reads zero. Now continue turning the handwheel until the gage reads the then full amount of the offset again. Adjust the horizontal handwheel (orange) See FIG. 19. Repeat until alignment is within .0020" [.05 mm]. Lock the horizontal locking handle (orange) when done.

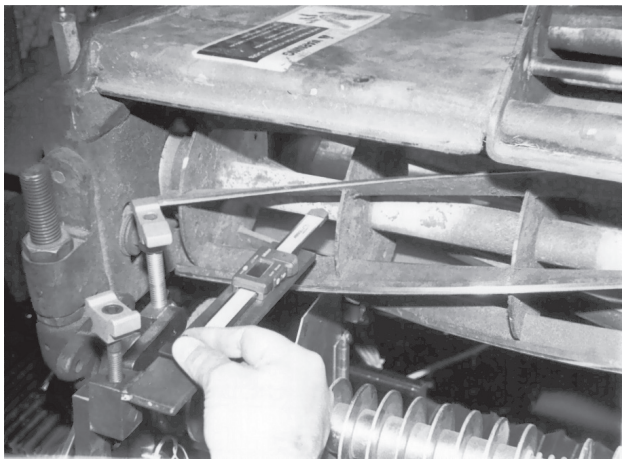


FIG. 18

Example: If the reel center shaft is off .085 left to right, turn the handwheel from .085 to zero and then continue to turn until it reads .085 additional on the other side of zero.

The reason for this is that the traverse frame pivots on the left end and is adjusted on the right end. Anytime the adjusting end is moved to change the right side dimension, the left side dimension is also changed at a ratio to the right side. By over compensating at the adjusting end you will compensate for this movement and get the reel aligned much faster.

Remove the horizontal extension bracket from the gage and store it on the mount inside the canopy for a 652 or on the right outside panel on the 632.

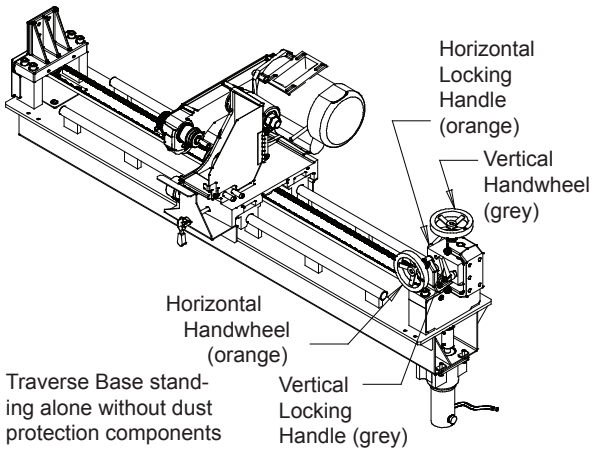


FIG. 19

VERTICAL ALIGNMENT

Install the digital alignment gage vertically on the carriage front dowel pin and pointing at the center of the reel shaft. Lock into place with knob. See FIG. 20

First, measure the left side of the reel as far to the left as possible, set the gage to zero, then measure the right side, at the same distance from reel centerline as the left side. See FIG. 21. Do not rotate the reel shaft except for a minimum amount to clear the gage when taking measurements. Adjust the grey vertical handwheel. See FIG. 19. First note the amount the reel is out of alignment. Then, with the digital gage still on the right side of the reel, turn the orange horizontal handwheel in the direction required until the gage reads zero. Now continue turning the handwheel until the gage reads the then full amount of the offset again. Repeat until alignment is within .002" (.05 mm).

Example: If the reel center shaft is off .085 left to right, turn the handwheel from .085 to zero and then continue to turn until it reads .085 additional on the other side of zero.

The reason for this is that the traverse frame pivots on the left end and is adjusted on the right end. Anytime the adjusting end is moved to change the right side dimension, the left side dimension is also changed at a ratio to the right side. By over compensating at the adjusting end you will compensate for this movement and get the reel aligned much faster.

Aligning the reel to a value less than .002 (.05 mm) will not improve the quality of the reel grind and will extend the alignment time. **DO NOT ALIGN THE REEL ANY CLOSER THAN .002 (.05 mm).**

Lock the grey vertical locking handle when done. Remove and store the gage on the mount located on the outside of the right side of the grinder.

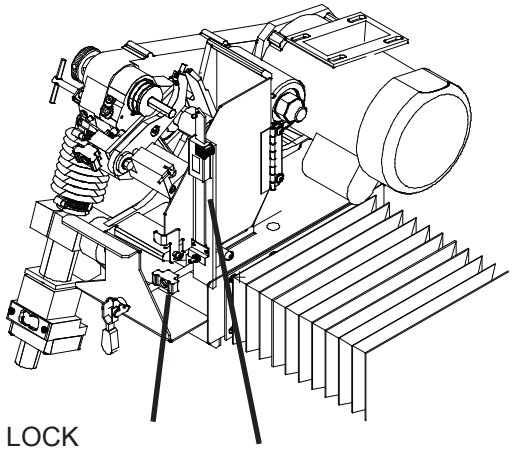


FIG. 20

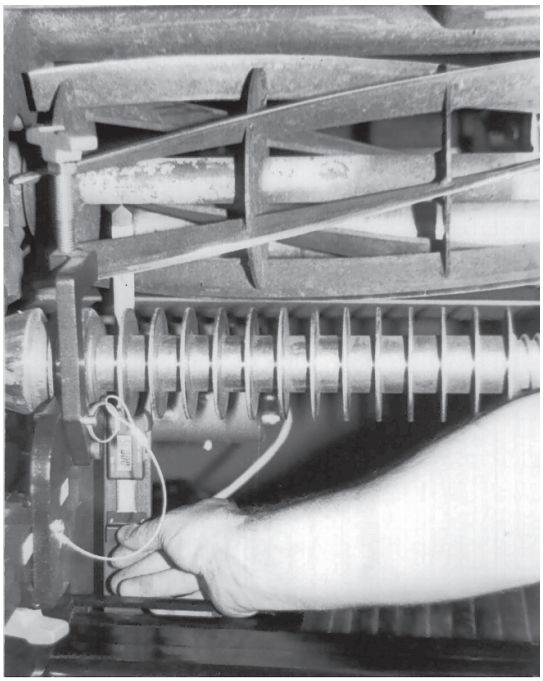


FIG. 21

ATTACHING THE VARIABLE SPEED SPIN DRIVE UNIT TO THE REEL

The spin drive unit attaches to the end of the reel shaft or a drive system component. Consult the cutting unit manufacturer for proper spin drive placement and attachment. Determine which side to mount the spin drive. This will generally be the same drive system component used for backlapping. See FIG. 22.

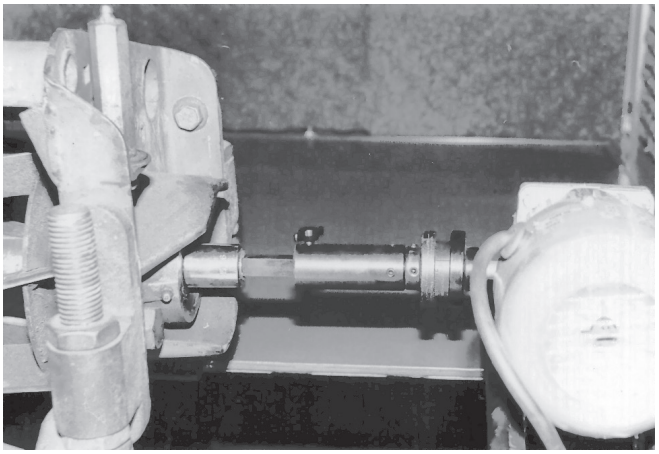


FIG. 22

Attach the spin drive unit onto the appropriate side.

When spin grinding, the reel should turn in the same direction
as the grinding wheel. See FIG. 23.

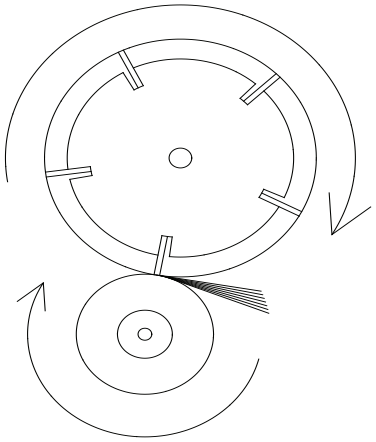


FIG. 23

Before positioning the spin drive unit let us familiarize ourselves with the available adjustments and coupler/drive assemblies. See FIG. 24.

KNOB A--
Adjusts the scissor bar to move the unit up and down.

KNOB B (2 each)--
Allows the spin unit to be loosened and moved in and out.

KNOB C & D--
Allow the spin assembly to be loosened from the support bar frame and moved side to side.

When positioning the spin unit it will be necessary to complete several of the above adjustments to properly align the spin unit to the reel.

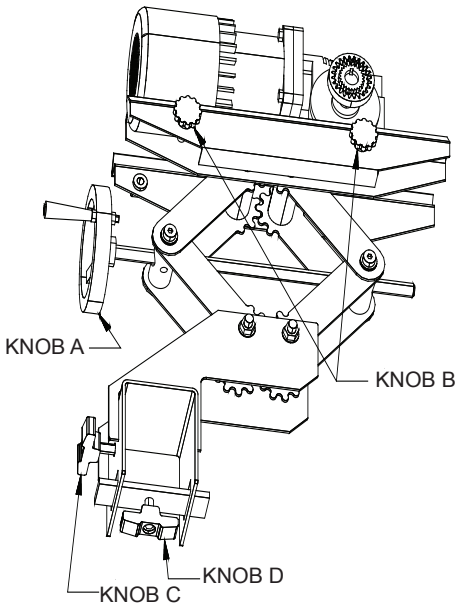


FIG. 24

The coupler/drive assembly includes:

RUBBER SLEEVE COUPLER: This is placed in the corresponding flange coupler already mounted in the spin drive shaft. See FIG. 25.

DRIVE COUPLER ADAPTER ASSEMBLY:
This is mounted to the rubber coupler.
Note: if the Drive Coupler Adapter is removed, there is a short square drive shaft attached to the Adapter Sleeve. This can be used with a scocket if there is limited space.

ADAPTER SLEEVE: Connects the rubber coupler to the square drive adapter.

SQUARE DRIVE ADAPTER: This is inserted into the drive coupler adapter and should be able to be moved approximately 2" [51 mm]. It will be necessary to move this when attaching reel to spin drive unit. It is then inserted into any 1/2" square drive socket or adapter. This square shaft has a groove machined into it on the opposite end of the snap ring. This groove is there to advise that you have reached the maximum extension of the square drive shaft. If you cannot connect the reel without extending past this groove, then the spin unit must be repositioned on the tooling bar (knobs C & D). See FIG. 24.

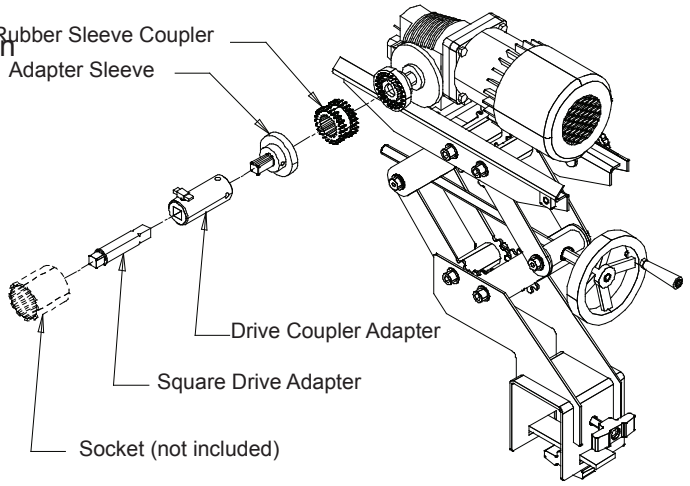


FIG. 25

NOTE: The 1/2" square drive socket or adapter that is placed on the reel when spin grinding is ***NOT*** included with the grinder. For Reel Drive Adapter information, seee page 38.

DO NOT EXTEND SQUARE SHAFT PAST GROOVE, INSTEAD REPOSITION SPIN UNIT.

The following procedures will make setting up the spin drive unit easier.

1. Move spin drive unit close to the reel. Align the shaft on the spin drive with the nut on reel by completing the necessary adjustments discussed on the previous page.
2. Now slide the spin drive unit approximately 7" [18 cm] from the reel drive coupling point and securely fasten to the square mounting bar tightening both locking knobs. (Knobs C & D)
3. Place the proper 1/2" square drive socket or adapter on the reel drive nut and then insert the square drive shaft into the socket. Place the adapter sleeve over the drive shaft and insert the drive coupler adapter assembly into it. Finally place the rubber coupler onto the drive coupler adapter. See FIG. 22.
4. By holding the square drive shaft firmly into position with your left hand you will be able to move the other components to the right and insert the rubber coupler into the flange on the spin drive unit. When this is done tighten the T-Knob on the adapter sleeve to hold all parts in place.
5. Finally readjust the spin drive unit if it is not in alignment.

NOTE: It is not necessary to have perfect alignment but it must be close enough so that the coupler remains engaged and that excess torque is not applied to the reel.

REEL DRIVE ADAPTERS

This grinder is equipped with an adapter that transfers the rotation from the spin drive gear box coupling to a 1/2"male square. To operate the grinder you need an adapter from this 1/2" male square to the reel shaft. These adapters are **NOT** included with this grinder.

Most cutting units manufactured in recent years have a male or female spline on the end of the reel shaft that connects to a hydraulic or electric motor shaft.

If you have a reel shaft that has an internal threaded end which you can access, install a hex head bolt or socket head screw of that thread size with a jam nut very tight so it does not loosen while spin grinding and then drive with a 1/2" drive socket for that hex or hex key size.

TORO EQUIPMENT:
Toro uses an 8 tooth female spline or a 9 tooth female spline on their reels. The 8 tooth female spline can be affectively driven with a Square Socket Drive Adapter [3/8"square male to 1/2" square female]. The 9 tooth spline requires an adapter. Our recommendation is to purchase adapter Toro tool part numberTOR-4074 available from K-Line Industries, Inc. 315 Garden Ave. Holland, MI 49424.

JOHN DEERE EQUIPMENT:
COUPLERS- The external spline shafts use a female splined coupler between the reel shaft and the male splined hydraulic motor shaft. The spline is either an 8,9 or 11 toothed spline. Our recommendation is to purchase the female splined coupler from John Deere and weld it to a short 1/2" square socket extension.
Note: The 8 tooth spline adapter can be used with a Square Socket Drive Adapter [3/8" square male to 1/2" square female] without welding.

REEL DIA	REEL TYPE	Recomendation
5"	G, M	Has an 8-T, External shaft. Use coupler AET11038
7"	H	Has an 11-T, External shaft. Use coupler TCA12581
		(NOTE: THIS CAN ALSO BE DRIVEN WITH A 1.25 HEX SOCKET)
7"	26H	Has a 9-T, External shaft. Use coupler AET11310
		(NOTE: THIS CAN ALSO BE DRIVEN WITH A 1.25 HEX SOCKET)
8"	ESP	Has a M16 X 2, External shaft. Use nut A31869 and drive with a 24mm Hex Socket.
5"	WBGM	Use a 3/8"-24 UNF Bolt, and drive with a 9/16 Hex Socket
5"	QA5	Has an 8-T, Internal Spline shaft. Use part AMT3022, to make an adapter.
7"	QA7	Has an 11-T, Internal Spline shaft. Use a 1.25 Hex Socket or make an adapter from part TCA18958.

JACOBSEN EQUIPMENT:
Below is a list of drive systems based on the cutting units:

* 5" reel units can be driven from the non hydraulic motor end of the reel. Install a 3/8" bolt in the end of the reel shaft with a jam nut very tight so it does not loosen while spinning. Use a 9/16" socket to drive. They can also be driven from the hydraulic motor end by pressing a Square Socket Drive Adapter [3/8" square male to 1/2" square female] into the splined reel coupling Jacobsen part number 337370 and use this pressed assembly as the adapter.
* 7" reel units can be driven from either end. The reel unit has a coupler attached to the reel shaft at both ends. Purchase Jacobsen part number 4102440 Reel Motor Shaft and weld the hydraulic motor shaft from the kit to a 1/2" socket and use this weldment as the adapter.
* Tri-King reel units can be driven on older pulley drive units with a 9/16" socket on the 3/8" bolt that holds the pulley On newer splined units, purchase the splined reel coupling Jacobsen part number 132002 and press a Square Socket Drive Adapter [3/8" square male to 1/2"square female] into the splined reel coupling and use this assembly as the adapter.

SETUP PROCEDURE FOR SPIN DRIVE RPM VERSUS TRAVERSE SPEED

SPIN DRIVE RPM IN SPIN GRINDING IS VERY IMPORTANT IN ACHIEVING A QUALITY GRIND. USE CARE IN ESTABLISHING THE SPIN DRIVE RPM, PER THE INSTRUCTIONS BELOW.
Generally, the Spin Drive RPM in spin grinding will be between 180 RPM (45%) and 380 RPM (100%). The speed required to spin a specific reel is dependant on reel diameter, the number of reel blades, and reel hardness. For all reels, there is an optimum Spin Speed where there is an **AGGRESSIVE**, yet smooth grind as you spin grind the reel. Your objective is to spin grind the reel as aggressively and as fast as possible while maintaining top quality.

It is recommended to start grinding each reel at a Spin Speed of 200 RPM (50%) and evaluate the RPM by adjusting higher and lower to optimize the Spin Speed for that reel. If the Spin Speed is incorrectly set, you can experience two problems, grinding wheel dressing or grinding wheel resonance. Each of these problems is explained below.

On some reels, especially small diameter high blade count reels if the Spin Speed RPM is set to high, the reel can act as a dresser to the grinding wheel. There can develop what appears to be a very aggressive grind (as if the infeed has self infed) and then a sudden stop of grinding with no grinding wheel to reel contact. If this occurs, your Spin Speed was set to high and you effectively dressed your grinding wheel.

Some reels have a resonant RPM where the reel goes into harmonics with the grinding wheel and the resonance vibrates the grinder and results in a very bad grind. By changing the Spin Speed to a higher or lower RPM you will move out of the resonant range.

After determining the best Spin Speed RPM for a reel, remember to save the setting when saving a program. By saving the correct RPM, you will avoid evaluating the Spin Speed the next time you grind the reel.

TRAVERSE DRIVE RPM
The Traverse Speed potentiometer is adjustable from approximately 5 feet per minute [1.5 meters per minute] to 20 feet per minute [6 meters per minute]. It is recommended to grind between around 15 feet per minute [4 meters per minute].

Grinding at a slower traverse speed, 10 feet per minute [3 meters per minute] as an example, will give a better finish but will extend the grind cycle time. Grind finish versus grind cycle time is controlled by the choice of the operator

VERIFY GRINDING WHEEL TO REEL END FRAME CLEARANCE

Install the 5" [127 mm] x 1" [25 mm] grinding wheel. Adjust the relief finger with the front hand knob so it clears the grinding wheel diameter (about 1/32" [0.8 mm]). Turn knob clockwise to move finger out and counter clockwise to move finger in. See FIG. 27.

NOTE: The 3.5" x 1" [89 mm x 25 mm] grinding wheel may be required for smaller reels, such as 5" [127 mm] diameter greensmowers, if clearance is required.

Pull the left side Plunger Pin and rotate the Finger and Body Assembly down (clockwise looking from the right side) to the spin position until the left side plunger pin locks into position. See FIG. 28.

Lock the index finger in the down position. Press down on the index finger and move the locking pin to the lock position. (Pin in). See FIG. 28

Move the grinding wheel up to within at an 1/8" [3 mm] of reel by going to the Spin Manual Touch Screen and depressing the Infeed Jog button up.

Move the Traverse Travel Limit switches out to allow the grinding wheel to reach the end of the reel. See FIG. 29. Depress the Traverse Jog button on the Spin Manual Touch Screen, to move the grinding wheel until it has cleared the end of the reel (if clearance to the frame allows) See FIG 31. When the grinding wheel is in position, move the Traverse Travel Limit switches in until the light on the proximity switch lights. Move the grinding wheel in a couple of inches and then back out to verify the switch properly stops grinding wheel. Repeat the process on the opposite prox switch.

IF THE REEL FRAME EXTENDS PAST THE REEL ITSELF, MAKE SURE THE STOP IS SET SO THAT THE GRINDING WHEEL WILL NOT RUN INTO FRAME WHEN GRINDING.

NOTE: When you go into the Spin Manual Touch Screen, the Finger and Body Assembly must be down and the index finger must be locked down. If this is not done, the spin drive and jog will not function and an alarm will blink on the

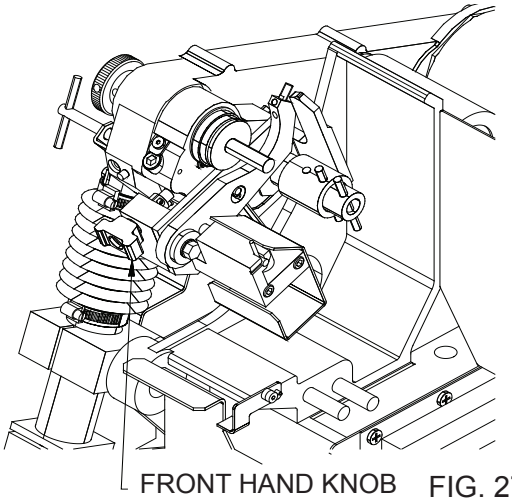
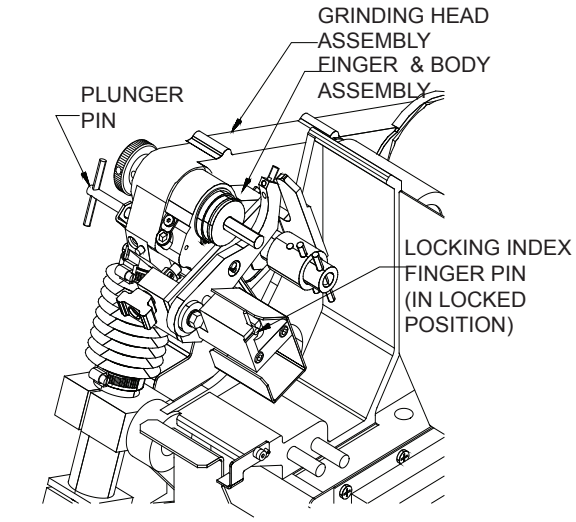


FIG. 27



DETAIL SHOWS FINGER & ASSEMBLY ROTATED (CLOCKWISE) INTO THE SPIN GRINDING POSITION (SHOWN W/O GRINDING WHEEL FOR CLARITY

FIG. 28

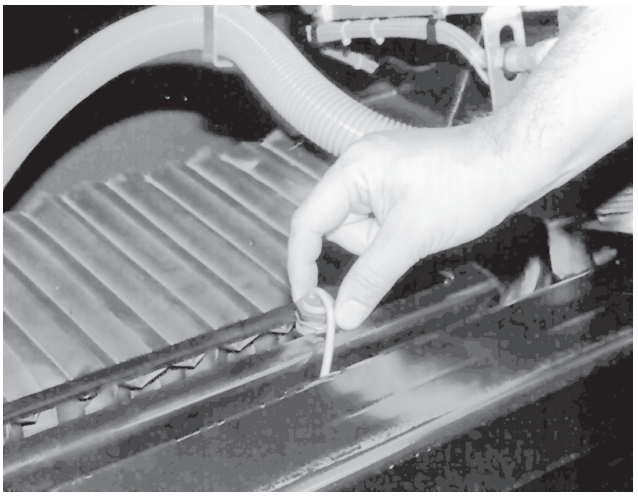


FIG. 29

Touch Screen.

Close and latch the doors, the grinding wheel motor and spin drive will not operate with the doors open.

Turn on the Grinding Wheel Motor and the Spin Drive Motor on the Spin Manual Touch Screen. Set the Spin Speed per the instructions on Page 37. Make sure spin rotation is the same as the grinding wheel - clockwise (CW) looking from right end. See FIG. 30. Go to the Spin Manual Touch Screen to change the spin motor direction. See FIG 31.

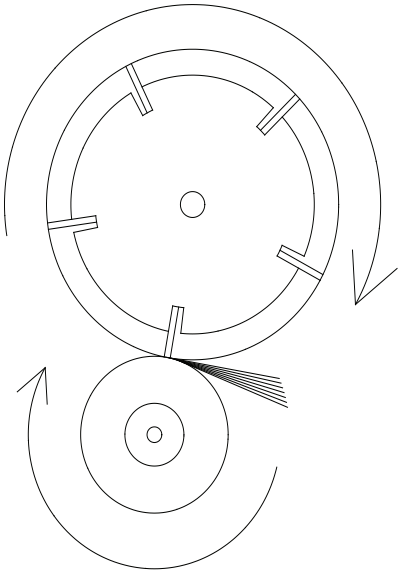


FIG. 30

NOTE: When the reel turns in the same rotation as the grinding wheel, the point of contact where they meet is in opposite directions.

Depress the up infeed button on the Spin Manual Touch Screen until start to see some light sparking on the reel.

Depress traverse jog button on the Spin Manual Touch Screen left and right to traverse across the reel to find the high areas.

NOTE: If the grind starts getting heavier, jog the infeed down again until you can travel the full length of the reel without heavy grinding.

NOTE: If you find excessive difference from one side to the other (more than 1/16 [1.5 mm]) you may want to verify alignment before going any further.

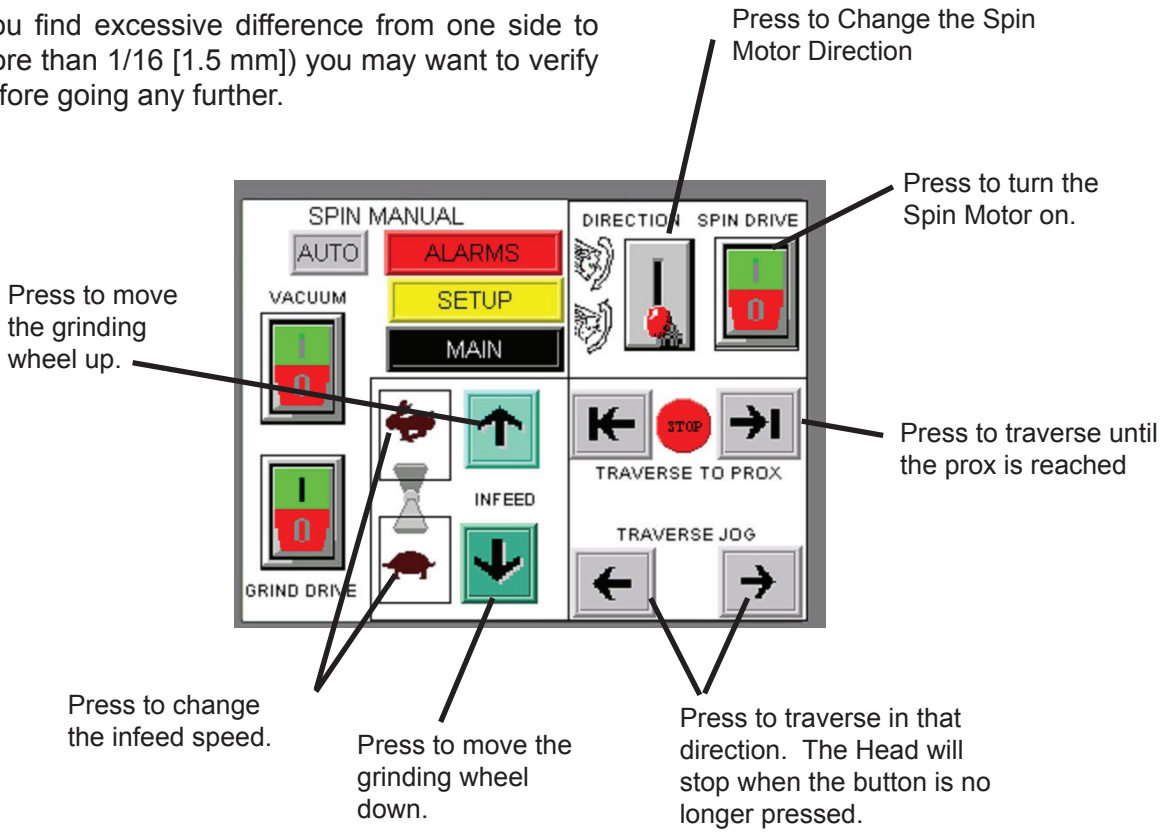


FIG. 31

SPIN GRIND

See grinding wheel safety instructions on page 5.

Manually traverse to **HOME POSITION** (all the way to the right side until the right side proximity switch is lit) using the Spin Manual Touch Screen. See FIG. 31.

To set up a new reel or enter your own setting press the SET-UP button. Then enter the information requested in the Spin Program Setup Screen. If you wish to use a saved program press the AUTO button then the PROGRAMS button on the Spin Program Run Screen. There are five prepackaged spin programs. You can either select one of these programs or develop your own program based on your best estimate as to how much material needs to be removed from the reel to sharpen the reel and remove all cone shape. See FIG. 32.

After the program is loaded or the information is enter verify that the information is correct on the Spin Program Run screen and press the ACCEPT VALUES button.

NOTE: Set the traverse speed to approximately 15 fpm [4 meters per minute].

Press the program RUN button. The PLC will turn on all necessary functions that are not currently running. You should watch the grinder to insure that it is cycling properly prior to leaving the machine in automatic cycle to do other work. If the grind is too light tough the QUICK INFEED .001" to infeed the wheel .001" while the program is running. The wheel will infeed .001" each time you tough the button, you must remove your finger to infeed another .001". The operator can also move the wheel down by touching the QUICK OUTFEED .001" button. See FIG. 32.

The Machine will grind until the program is finished. When the program is finished, the grinding wheel will stop at the home position, the vacuum motor, spin motor and grind motor will shut off, and amber light on top of the machine will flash.

Open the doors and inspect the reel. If it is good, go to the relief grind, if not, repeat the spin program as required.

If you wish to inspect the reel in the middle of a grind program, press the PAUSE button. The program will finish the traverse cycle it is currently on and then stop at the home position. You can then open the doors and check the reel. If you wish to continue hit RESUME or press the CANCEL button to end the program.

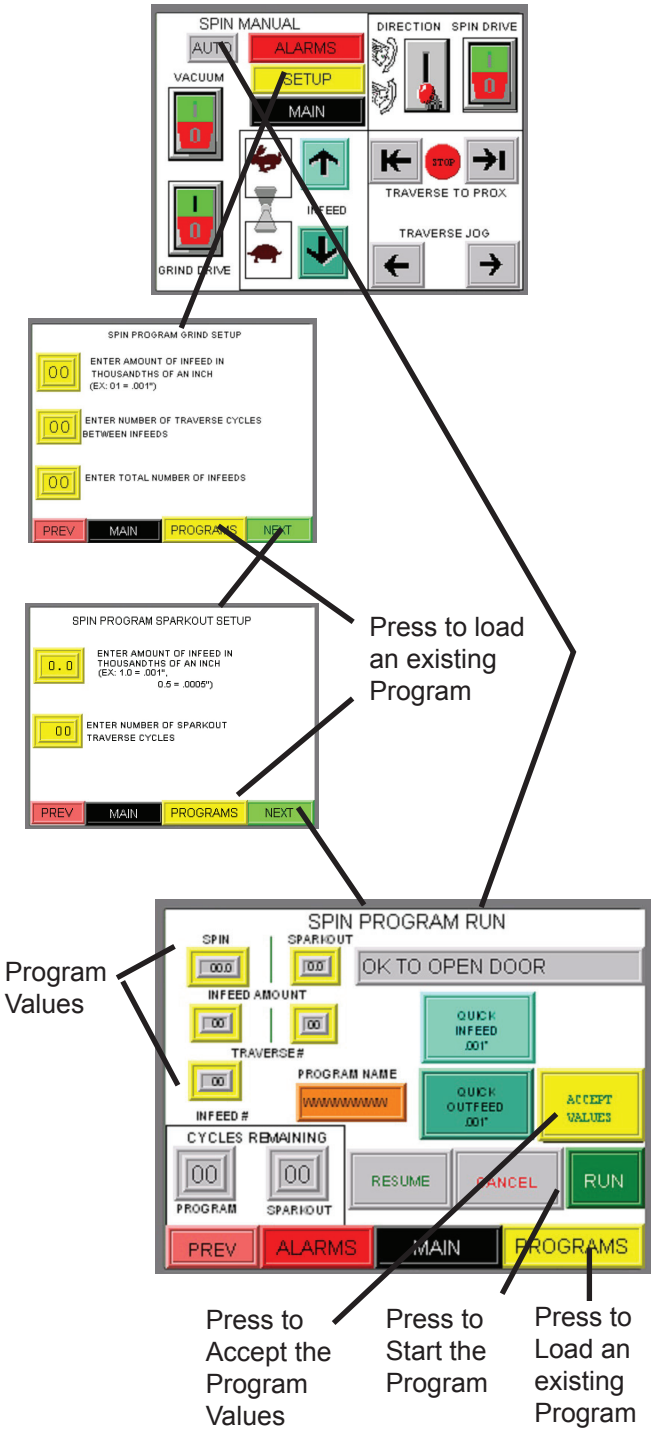


FIG. 32

After the program is completed you may save the settings to a program file to be used later by pressing the PROGRAMS button. Since both the spin and relief information is stored in a program it may be faster to wait until after the relief grind is completed before saving the program. Make sure to note what the spin speed was so it can be enter into the program for future reference.

RELIEF GRIND

Replace the 1" wide [25mm] grinding wheel with a 3/8" [10 mm] wide releif wheel for relief grinding. As the reel diameter gets smaller and the number of blades increases a smaller diameter wheel tends to work better. A 3.5" Dia. [89 mm] x 3/8" [10 mm] wide wheel is furnished with the grinder for these smaller reels. As a general rule, use the largest grinding wheel practical to relief grind. (A larger 5" Dia. [127 mm] x 3/8" [10 mm] wide is also furnished with the grinder and should be used on the larger reels.)

NOTE: 5" [127 mm] diameter greensmower reels with 11 blades require a 3.5" [89 mm] diameter grinding wheel. Adjust the relief guide finger with the front hand knob so there is a small gap between the guide finger and the wheel (about 1/16" [1.5 mm]).

REEL SPIRAL

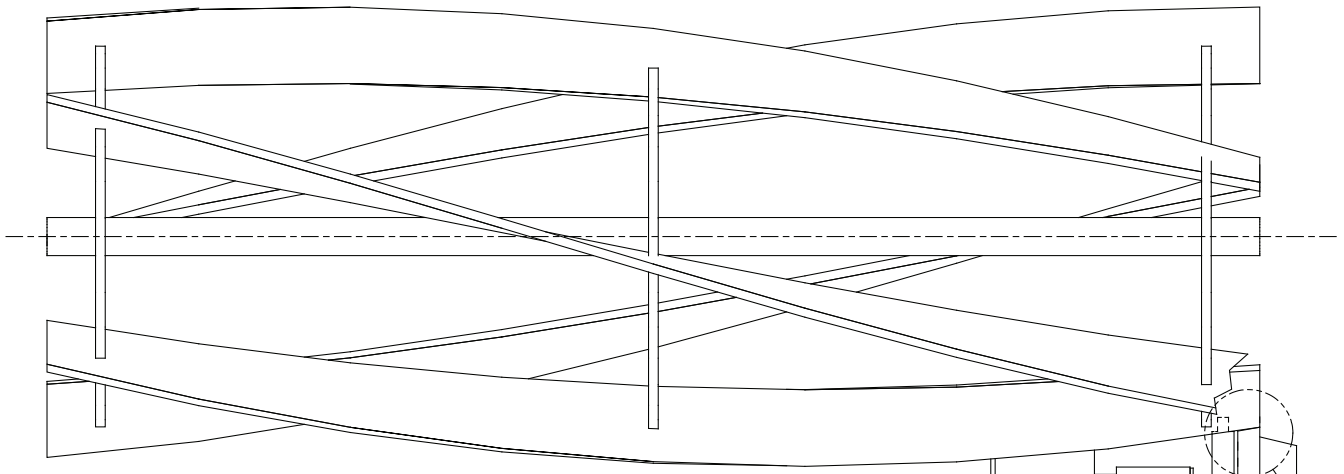
Check to see if your mowing unit is a normal or reverse helix.

PAGE 42 SHOWS A NORMAL REEL HELIX.
Note the high point of the relief finger is always on the right hand side of the rinding wheel. If the wheel has a taper, place the high side of the wheel to the left side for a normal helix reel. This will allow the wheel to grind to the end of the blade.

PAGE 43 SHOWS A REVERSE REEL HELIX.
Note the high point of the relief finger is always on the right hand side of the rinding wheel. If the wheel has a taper, place the high side of the wheel to the left side for a normal helix reel.

Most mowing units are normal helix.

THE HIGH POINT OF THE RELIEF FINGER SHOULD ALWAYS BE AT THE CORNER OF THE GRINDING WHEEL THAT IS MAKING CONTACT WITH THE REEL. ON THIS GRINDER THAT IS ALWAYS THE RIGHT HAND SIDE OF THE GRINDING WHEEL. SEE PAGES 44 AND 45.

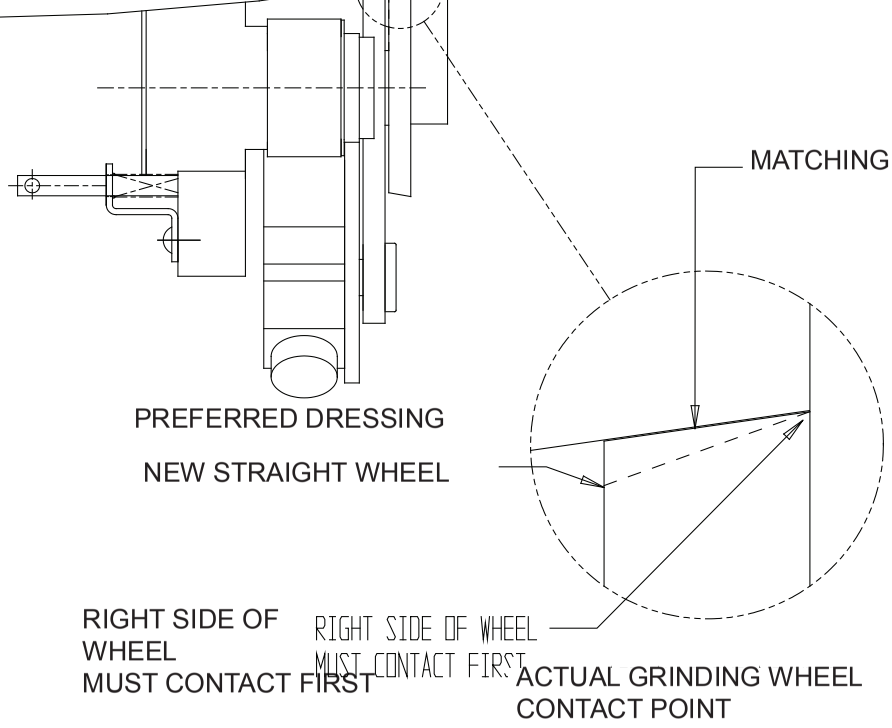


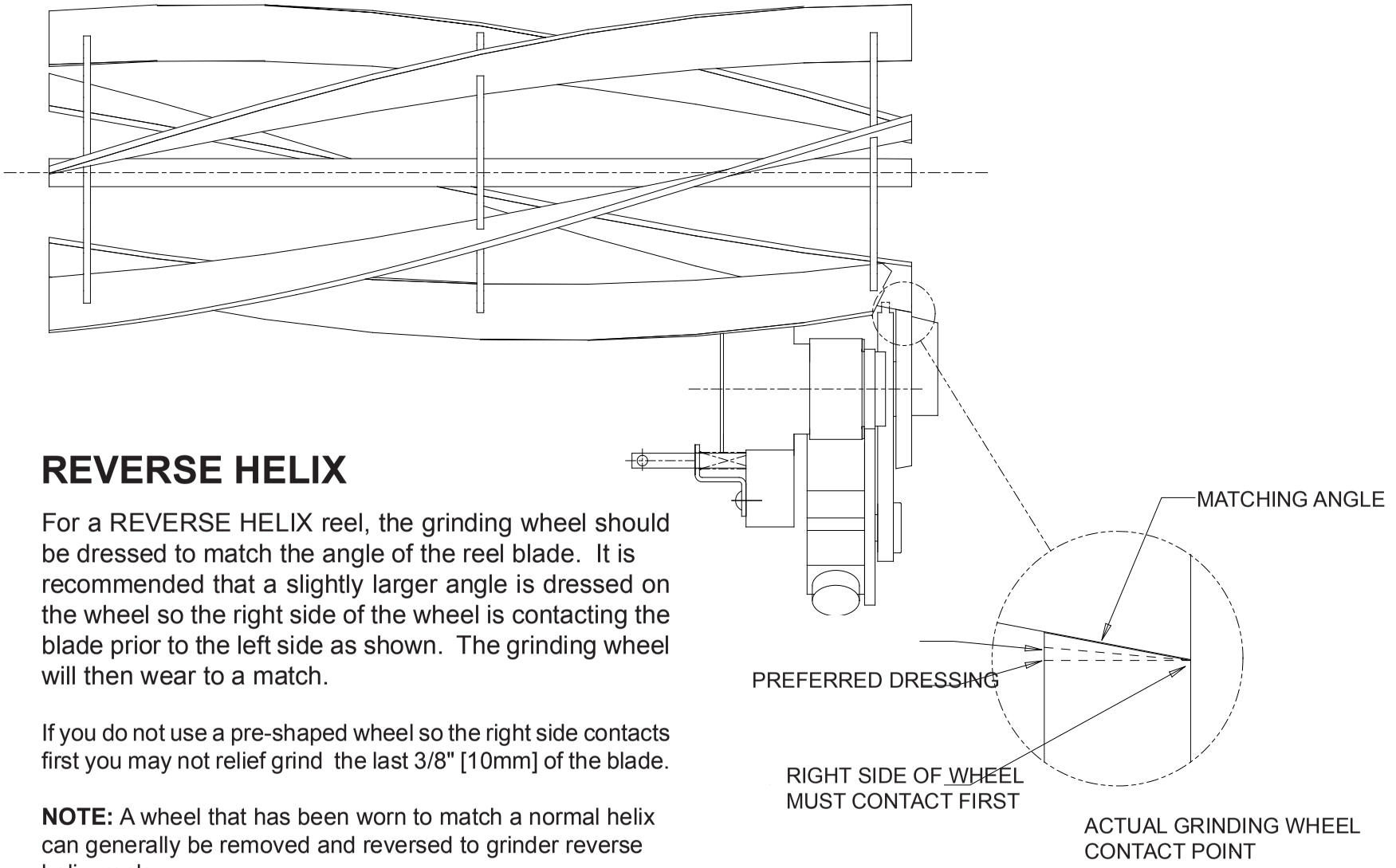
NORMAL HELIX

For a NORMAL HELIX reel, the grinding wheel should wear to match the angle of the reel blade.

NOTE: The square faced grinding wheel as from the factory can be used for normal helix reels and will wear to match the reel blade helix.

Normal helix reels are also refered to as Left Hand Side Cutting First (Looking from front - grass entry position.) or Right Throw reels (Throws grass to the right of operator position.)


MATCHING ANGLE
PREFERRED DRESSING
NEW STRAIGHT WHEEL
RIGHT SIDE OF WHEEL MUST CONTACT FIRST
RIGHT SIDE OF WHEEL MUST CONTACT FIRST
ACTUAL GRINDING WHEEL CONTACT POINT



REVERSE HELIX

For a REVERSE HELIX reel, the grinding wheel should be dressed to match the angle of the reel blade. It is recommended that a slightly larger angle is dressed on the wheel so the right side of the wheel is contacting the blade prior to the left side as shown. The grinding wheel will then wear to a match.

If you do not use a pre-shaped wheel so the right side contacts first you may not relief grind the last 3/8" [10mm] of the blade.

NOTE: A wheel that has been worn to match a normal helix can generally be removed and reversed to grinder reverse helix. reels.

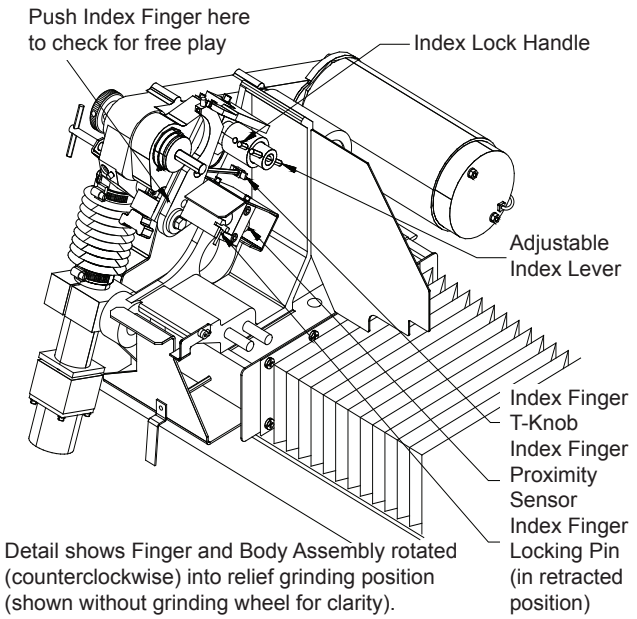
Reverse helix reels are also refered to as Right Side Cutting First reels (Looking from the front - grass entry side) or Right Throw reels (Throw's grass to the right of the operator position.)

Reset the Traverse Limit Proximity Switch so the grinding wheel clears the reel at both ends by approximately 1/16" [1.5 mm]. Make sure the Reel Positioner Adjuster is set at its mid point. See Relief Angle Adjustment on Page 15.

Pull the left side plunger pin and rotate the Finger and B Assembly up (Counter-clockwise looking from the ri into the relief position until the left side plunger pin l into position. See FIG 33. The plunger pin must be engaged to the Adjustable Relief Adjuster for proper func

Pull the right side locking index finger pin to release the index finger and rotate the handle into the retracte position. See FIG. 33.

Go into the Relief Manual Touch Screen. See FIG. **NOTE:** When you put the selector in relief, the Finger Body Assembly must be up and the index finger mus unlocked and in the forward position. If this is not d the spin drive and jog will not function and a Touch Sc alarm will be displayed.



Detail shows Finger and Body Assembly rotated (counterclockwise) into relief grinding position (shown without grinding wheel for clarity).

FIG. 33

Set Spin Drive Rotation switch On the Relief Manual Touch Screen to rotate the reel into the stop finger, counterclockwise (CCW) when looking at the right side. **NOTE:** Relief torque reel rotation is always opposite spin rotation.

With the traverse in <u>home</u> position (over right side prox), press the infeed jog button on the touch screen to move the grinding head up while rotating the reel with you hand until the index finger touches the reel blade.

With the traverse in the home position and a reel blade on the index finger only. Loosen the Index Lock Handle and rotating the index adjust lever on the right side of the grinding head. See FIG. 33. Set the position of the index finger so that the blade can move from the index finger to the relief finger when traversing left. If the finger is set too far back the blade will hit the side of the relief finger when traversing left. This position must also allow approximately 1/32" [1 mm] free play of the index finger when the blade is resting on the high point of the relief finger. See FIG. 33. Check by jogging left until the reel blade is on the relief finger. When this is completed, lock the indexing finger into position by tightening the index lock handle. Continue to jog the grinding head up until there is minimal clearance between the reel blade and the grinding wheel.

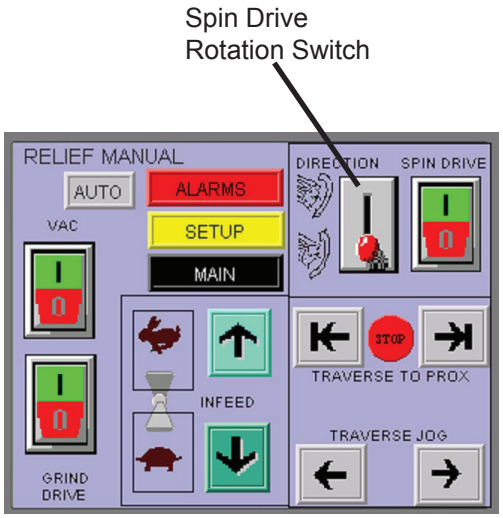


FIG. 34

Check the Proximity Sensor on the Index Finger (right side proximity switch under the spark shield) to insure that it makes contact (the proximity switch light on) when the index finger catches a reel blade.

Close and latch the doors, the grinding wheel motor or spin drive will not operate with the doors open.

Turn the Spin Drive motor on. **NOTE:** The spin drive will apply a torque load against the fingers.

Set the Relief Torque Potentiometer at approximately 15. **NOTE:** Free turning reels may need a lower value than 15. Stiff reels or reels with a drive train may need a higher torque than 15. Do not exceed 45 on the relief torque potentiometer setting.

Manually jog the traverse all the way to the left watching for proper clearance between the grinding wheel and the blade. Check for proper clearance between the index finger (after releasing from blade at far left position) and the front side of the blade on the return trip to the home position. Also verify clearance to the reel blade support spiders.

Stop the traverse in home position and check for a proper blade index.

At this point, you can adjust the relief angle by turning the Micro Adjuster for Relief Angle. See FIG. 35. You can increase the relief angle approximately 8 degrees by rotating the Reel Positioner Adjuster clockwise. You can decrease the relief angle approximately 8 degrees by rotating the Reel Positioner Adjuster counterclockwise.

Press the SET-UP button and enter the information requested or press the PROGRAMS button on the Relief Program Setup Screen or Relief Program Run Screen to load and existing program. There are five prepackaged Relief programs. You can either select one of these programs or develop your own program based on your best estimate as to how much material needs to be removed from the reel blade to achieve the correct relief. See FIG. 36.

After the program is loaded or the information is entered from the Relief Setup Screen check the setting located in the upper left hand area of the Relief Run Program screen. If a prepackaged program is selected, press the Blade # button to set relief blade number to match the number of blades in the reel. FIG. 36.

NOT HAVING THE NUMBER OF BLADES SETCORRECTLY WILL RESULT IN DOUBLE GRINDING OF SOME BLADES OR NOT GRINDING ALL OF THE BLADES.

Micro Adjuster for Relief Angle

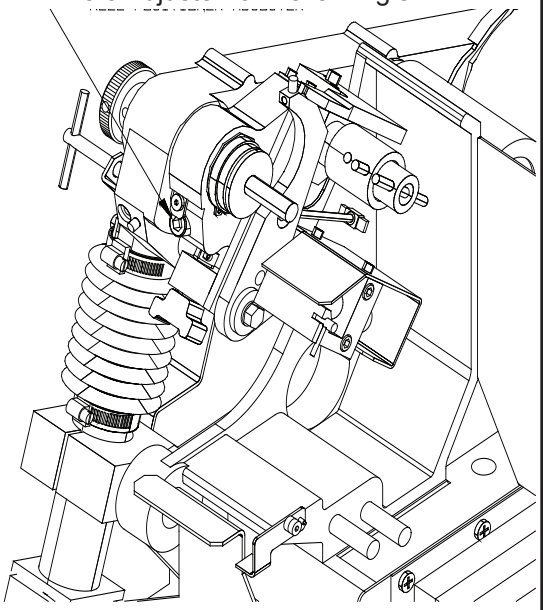


FIG. 35

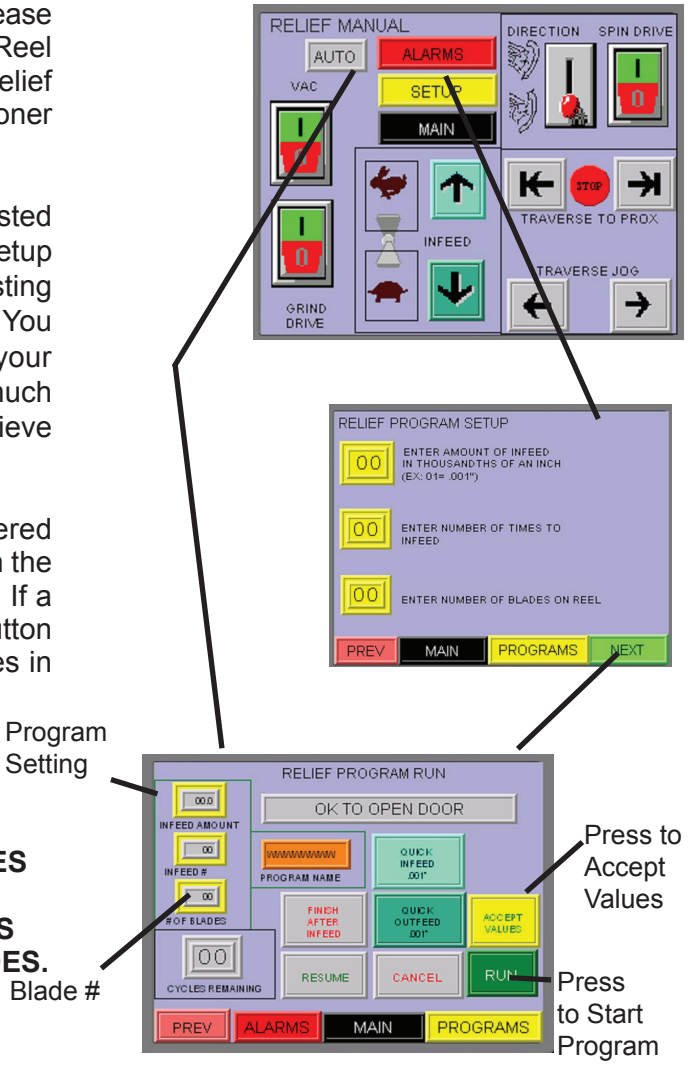


FIG. 36

NOTE: Traverse speed should be approximately 15 fpm. If you are removing a small amount of stock on initial infeeds, faster traverse speeds are suggested. If you are removing a large amount of stock on later infeeds, slower traverse speed may be required.

Push Program RUN button. The PLC will turn on all necessary functions that are not currently running. You should watch the grinder insure that it is cycling properly prior to leaving the machine in automatic cycle to do other work. If the grind is too light tough the QUICK INFEED .001" to infeed the wheel .001" while the program is running. The wheel will infeed .001" each time you tough the button, you must remove your finger to infeed another .001". The operator can also move the wheel down by touching the QUICK OUTFEED .001" button. See FIG. 36.

The program will grind until done, then it will turn off the dust collector, spin motor, traverse motor, grinding motor and will park at the home position. The amber light on top of the grinder will flash when the program is completed.

Open the doors and inspect the relief grind. Repeat the relief grind if needed. The flashing light will turn off if the doors are opened or the Cycle Complete button is pushed on the Touch Screen.

If you wish to inspect the reel in the middle of a grind program, press the PAUSE button. The program will finish the traverse cycle it is currently on and then stop at the home position. You can then open the doors and check the reel. If you wish to continue hit RESUME or press the CANCEL button to end the program.

After the relief program is complete you may wish to save the program. Go to the Spin or Relief Run Program Screen and press the PROGRAMS button. This will bring you to the Programs screen where you can save, edit or load a program. See Page 45 for more information.

REELS WITH ONE OR MORE BLADES BROKEN OFF FROM THE OUTSIDE SPIDER TO THE EDGE OF THE REEL CANNOT BE RELIEF GROUND IN AUTOMATIC CYCLE. YOU MUST RELIEF GRIND THESE REELS IN THE MANUAL MODE CONTROLLING THE TRAVERSE TRAVEL WITH THE TRAVERSE JOG SWITCH.

LOADING A PROGRAM

To load a program go to the Programs Screen. You can access the Programs Screen from the Spin or Relief Program Run Screen. First, select the directory you wish to choose the program from by pressing the SELECT DIRECTORY button and choose either the Default or Custom directory. The Default directory contains the factory preset Spin & Relief programs. These programs cannot be deleted or edited. The Custom directory allows the operator to select the Spin and Relief setting and save these setting under a name. When a directory is choosen the name of that directory will be displayed in the DIRECTORY box.

To load a program from that directory press the SELECT PROGRAM button. A list of programs in that directory will come up. Press the program you wish to use. The settings for that program will be displayed in the boxes on the Programs Screen. To run this program press the SPIN/RELIEF AUTO button. (This button will change from Spin to Relief depending on the position of the Finger and Body Assembly is in the Relief or Spin position.)

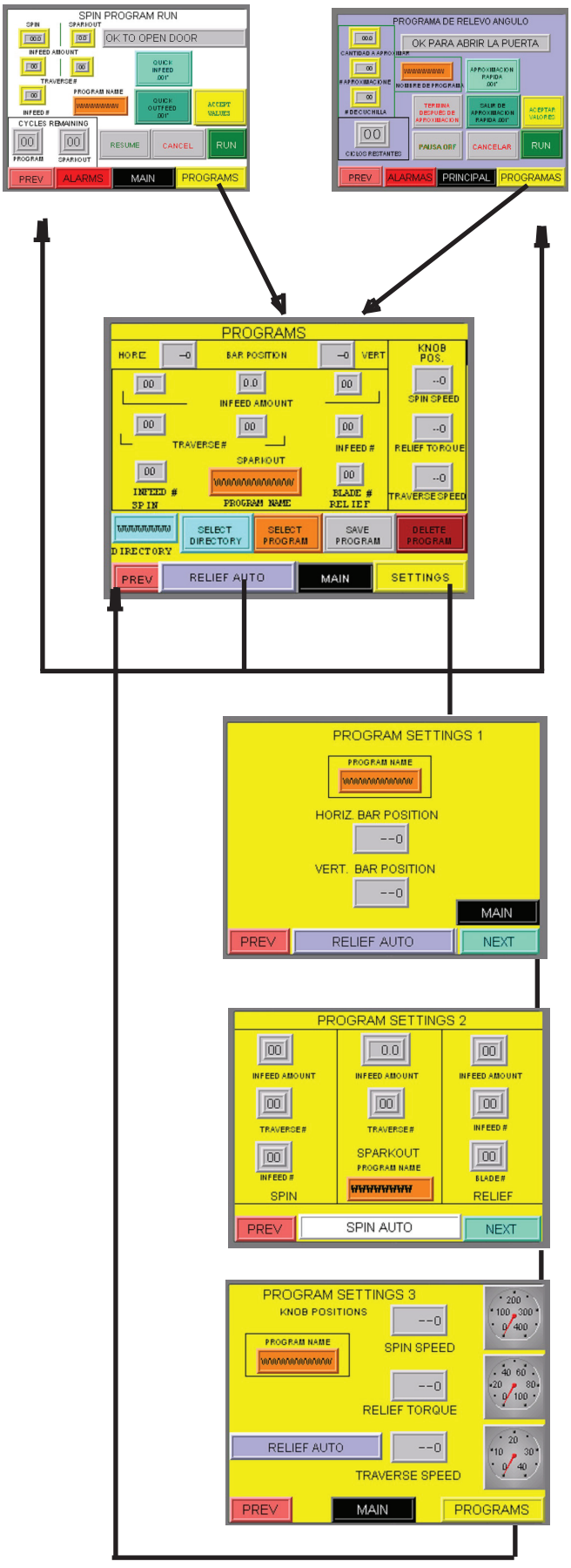
To start the program press the ACCEPT VALUES button and then the RUN button.

SAVING/CREATING A PROGRAM

After a Spin or Relief grind is completed, the operator can save the settings used to a program to be used at a later date. To save or create a program go to the Programs Screen and select the Custom Directory as described above. The SAVE and DELETE buttons will appear on the screen when the Custom Directory is selected.

Press the SETTINGS button and enter the data on each of the screens. Press the PROGRAMS button on the Programs Setting 3 Screen to return to the Programs sreen. If the settings on the Programs Screen are correct, press the SAVE PROGRAM button to save these settings to a name. When the SAVE PROGRAM button is pressed it will ask you to for a name to save these settings under. There is a maximum of 8 characters for each name. NOTE: A program name will be displayed on the Programs Settings Screens. This name displayed is the last one loaded. The new data will not be saved to this or any name until the SAVE PROGRAM button is pressed.

A program can be edited by loading the program using the SELECT PROGRAM button then press the SETTINGS button and make any desired changes. Finally return to the Programs Screen and Save the settings under the save name.



ACCU-MASTER SPIN GRINDING INFEED PROGRAMS:

PROGRAM	STOCK REMOVAL	GRIND INFEED	TRAVERSES AFTER INFEED	TOTAL CYCLES
SPIN 1	.010	.005	3	
		.005	3	
		.000	15	21
SPIN 2	.020	.005	3	
		.005	3	
		.005	3	
		.005	3	
		.000	15	27
SPIN 3	.040	.005	3	
	Small	.005	3	
	Reels	.005	3	
		.005	3	
		.005	3	
		.005	3	
		.005	3	
		.005	3	
		.000	15	39
SPIN 4		.005	4	
	.040	.005	4	
	Large	.005	4	
	Reels	.005	4	
		.005	4	
		.005	4	
		.005	4	
		.005	4	
		.000	15	47
SPIN 5	.0005	.0005	18	18
	Spark Out			

ACCU-MASTER RELIEF GRINDING INFEED PROGRAMS:

PROGRAM	STOCK REMOVAL	GRIND INFEED	TRAVERSES AFTER INFEED	TOTAL CYCLES
RELIEF 6	.008	.008	1 x No. of Blades	5 for 5 blade 11 for 11 blade
RELIEF 7	.012	.006 .006	1 x No. of Blades 1 x No. of Blades	10 for 5 blade 22 for 11 Blade
RELIEF 8	.020	.010 .010	1 x No. of Blades 1 x No. of Blades	10 for 5 blade 22 for 11 blade
RELIEF 9	.030	.010 .010 .010	1 x No. of Blades 1 x No. of Blades 1 x No. of Blades	15 for 5 blade 33 for 11 blade
RELIEF 0	.040	.010 .010 .010 .010	1 x No. of Blades 1 x No. of Blades 1 x No. of Blades 1 x No. of Blades	20 for 5 blade 44 for 11 blade

REEL SETUP CHART

Note: These dimensions will vary due to reel position in frame, reel dia., height of cut, roller position, etc. Use these values as a guide only.

REEL MAKE, MODEL & HEIGHT OF CUT	PROGRAM NAME	TOOLING VERTICAL SCALE	TOOLING HORIZONTAL SCALE	TOOLING DISTANCE APART	SPIN DRIVE MOUNTING SIDE R or L	GRINDING WHEEL DIA.	SPIN SPEED SETTING	SPIN TORQUE SETTING	TRAVERSE SPEED SETTING	NOTES